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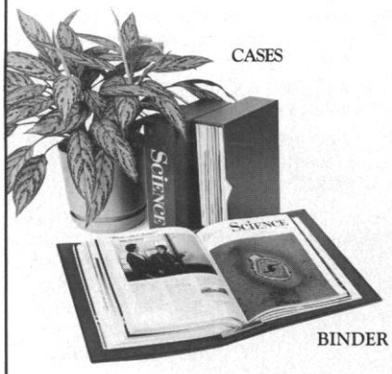

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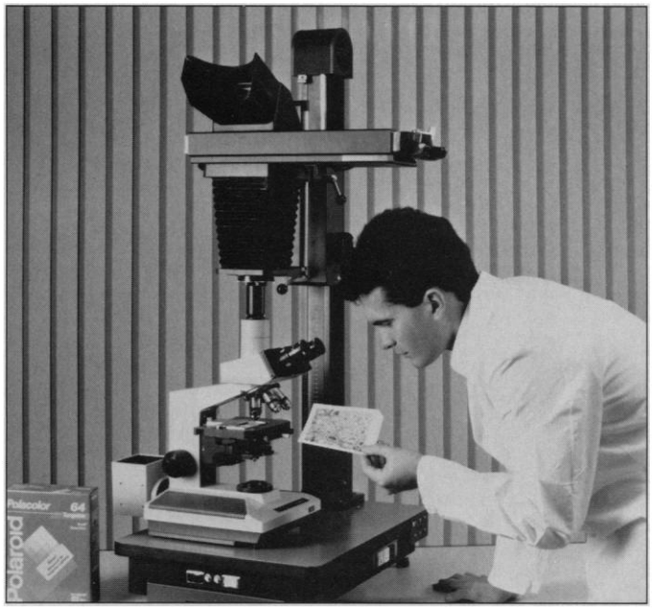

Camera System

The MP 4+ is a multipurpose copystand camera system for scientific and medical imaging applications. The modular system has an extensive selection of accessories and three new lighting options, enhancing its ability to function as an instant copystand for photomicrographic and photomacrographic imaging, an offstand studio or laboratory view camera, or a 35-mm copystand. The standard system consists of a camera body, fixed column with an overall height of 46 inches, standard 18 inch by 23 inch laminated baseboard, reflex viewer lens for easy focusing and eye-level viewing, contour hood, ground glass, shutter, and film holder. Polaroid Corp. Circle 92.

■

Plasmid DNA Isolation

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Preparative Chromatography System

The PrepLC 2000 Preparative Chromatography System is a fully integrated and automated system for preparative purification and isolation. It performs a variety of tasks ranging from the purification of organic synthesis and natural products to the isolation of peptides and proteins. Features include gradient solvent delivery, automated sample injection, and a recycle feature that allows the user to conserve solvent by recycling the difficult to separate compounds through the system and to achieve better resolution with each pass; flow rates from 4 to 300 ml/min; 2000-psi backpressure capability; and manual or automated fraction collection. Millipore. Circle 94.

Stopped-Flow Spectrofluorimeter

The SF-61mx Multi-Mixing Stopped-Flow Spectrofluorimeter introduces a flexible double-mixing apparatus for improved performance. Features of the system include the use of a unique fused silica multimixing manifold that reduces prime volume and reduces the use of Teflon in the sample flow circuit to confer true anaerobic performance. Aging times for reaction mixtures are under full control of the operating software and can be adjusted from 10 ms upward. Hi-Tech Scientific. Circle 95.

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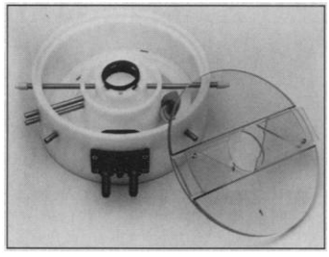
Tissue Chamber

InVitro-1 is a bench-top environmental chamber designed to keep eukaryotic tissue alive for several days during electrophysiological experiments. While designed to study single nerve cell activity in a thin slice of mammalian central nervous system tissue, InVitro-1 can maintain any tissue. Tissues can be of plant or animal origin and can range in complexity from simple multicell single layer organisms to complex three-dimensional organ systems. The chamber consists of two concentric rings surrounding a central chamber, allowing for accurate control and rapid manipulation of the perfusion medium's temperature and gas content, while monitoring temperature, pH, and dissolved oxygen. World Precision Instruments. Circle 96.



Mass Spectrometry System

The M-1000 LC/QMS instrument is a liquid chromatography/atmospheric pressure chemical ionization mass spectrometry system that features atmospheric-pressure chemical ionization (APCI) and electrospray ionization (ESI). APCI offers high sensitivity and a variety of ion-molecule reactions can be utilized for added sensitivity. Because ESI can produce multiple charging of analyte species, high molecular weight compounds can be analyzed using a nominal range mass analyzer. The combination of these interfaces with the separation power of modern liquid chromatography equips the M-1000 for challenging research problems. Hitachi Instruments. Circle 97.

■

Literature

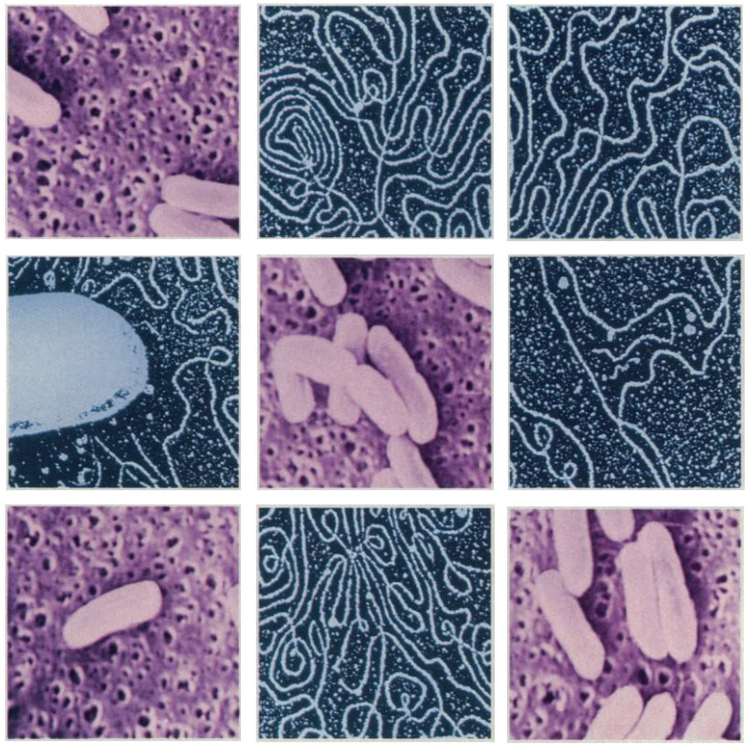
High Performance Columns for Affinity Chromatography is an eight-page brochure that describes in detail the TSK-GEL AFC line of columns developed for the selective purification of proteins and other biomolecules. The bulletin summarizes the properties of 39 affinity columns and packings and includes 12 chromatographic applications examples. The series is especially suited to large biomolecules. TosoHaas. Circle 98.

A comprehensive "Laboratory Safety Reference Guide" has been added to the *1992 EM Science Products Catalog*. The 44-page guide includes a review of spill and exposure classifications for 22 hazardous chemical groups, spill treatment procedures, and a reference list of incompatible chemicals. The catalog describes analytical and high-purity reagents, solvents, and acids; instrumental standards; moisture determination systems; chromatography products; and laboratory safety products. EM Science. Circle 99.

News from the Planar Chromatography Front is a newsletter for the thin-layer chromatographer. Camag Scientific. Circle 100.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card and placing it in a mailbox. Postage is free.

Transformation You Can Bank On



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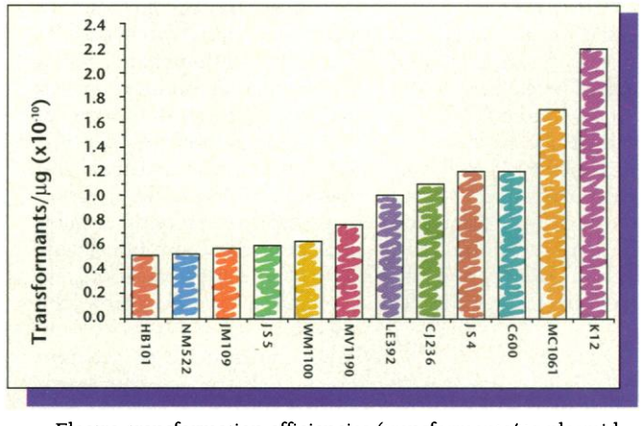
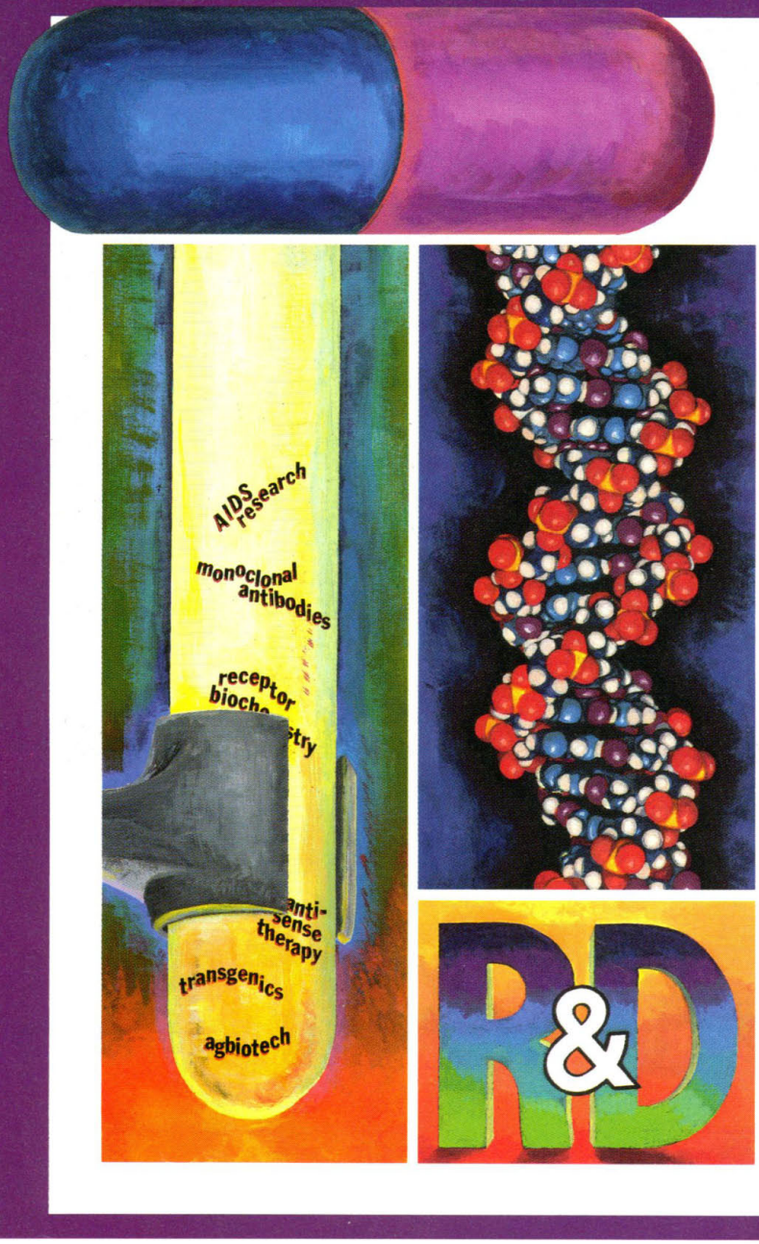


Electro-transformation efficiencies (transformants/µg plasmid DNA) obtained with 12 different strains of *E. coli* using the E. coli Pulser and 0.1 cm cuvettes.

CAREERS IN PHARMACEUTICALS & BIOTECHNOLOGY



Drug Discovery Biologists

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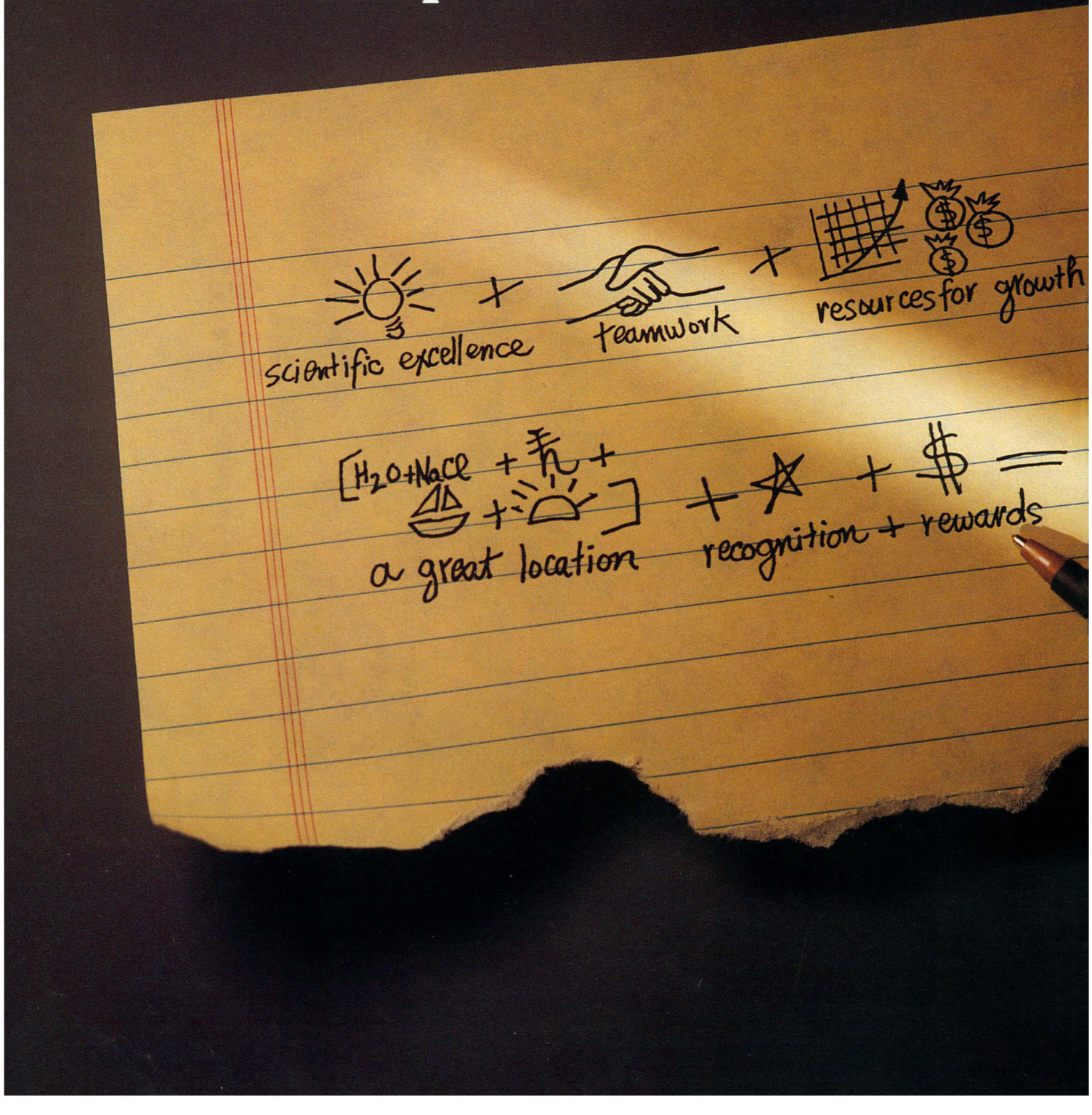

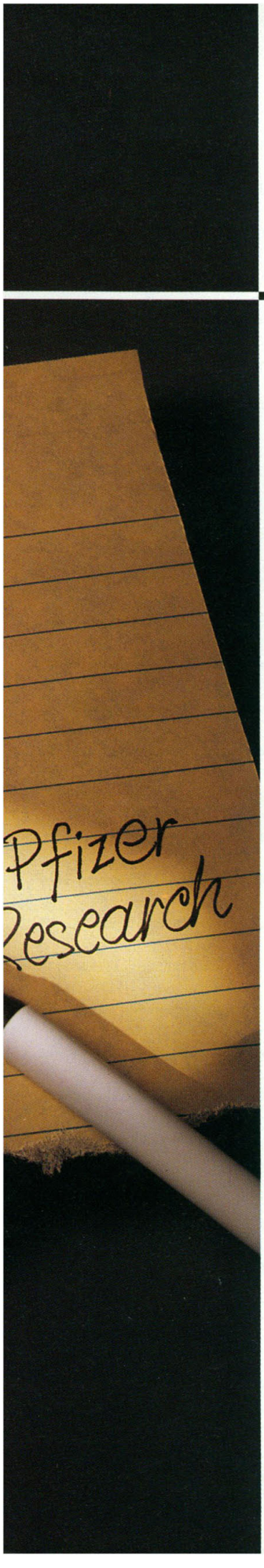

Pfizer Central Research has several immediate openings for research scientists to join one of our multidisciplinary project teams. You will be engaged in research to discover novel therapies for a variety of diseases.

Immunopharmacology

As a member of our Immunopharmacology Research Group, you will participate in our ongoing drug discovery efforts in the area of immune enhancement and support.

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Immune Suppression–You will apply your thorough knowledge of cell activation at the molecular, biochemical and/or cellular level to identify novel targets for drug discovery—a knowledge of the applicability as well as the limitations of currently used *in vivo* models would be particularly helpful.

Candidates should have a PhD in the biological sciences and postdoctoral experience. Several years of industrial experience would be a distinct advantage.

Bone Cell Biology

Research Scientist–Your qualifications should include a PhD degree in Biochemistry/Cell Biology and at least two years postdoctoral training. Demonstrated expertise in the isolation and culture of cells, stem cell and osteoblast differentiation and regulation, receptor/ligand binding or radioimmunoassays is necessary. You will be expected to establish and maintain collaborations with other scientists in the molecular biology, pharmacology and medicinal chemistry disciplines.

Assistant Scientist–You should possess a BS/MS degree in one of the biological sciences and have two years of research laboratory experience. Expertise in one or more of the following techniques is desired: organ/cell culture, immunohistochemistry, RIA, biochemical assays, ELISA and HPLC.

Protein Chemistry

Assistant Scientists–Candidates for these positions should have a BS or BS/MS in Biochemistry or a related field. Especially sought are individuals with a fine academic background and some experience in protein purification, while additional experience in other areas will also be welcome. Knowledge of chromatography and electrophoresis is essential. An acquaintance with receptor binding assays will be helpful for one position.

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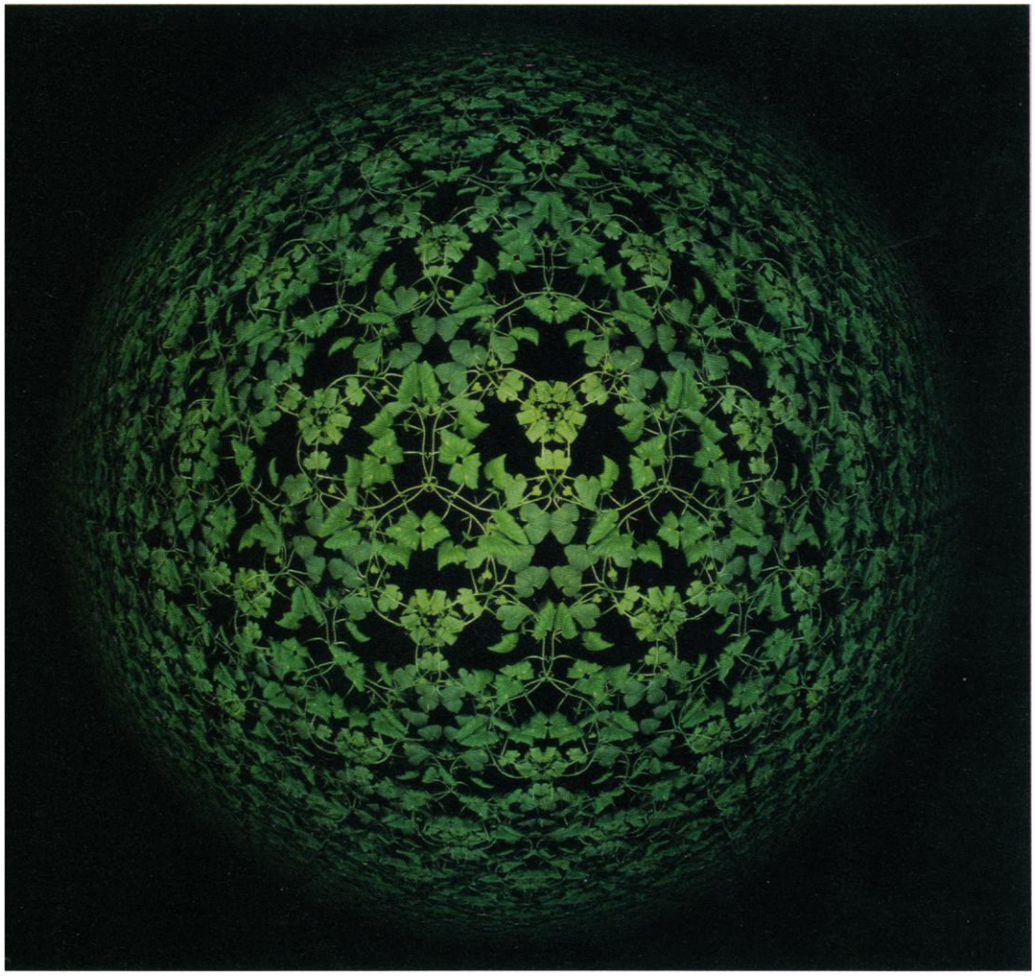

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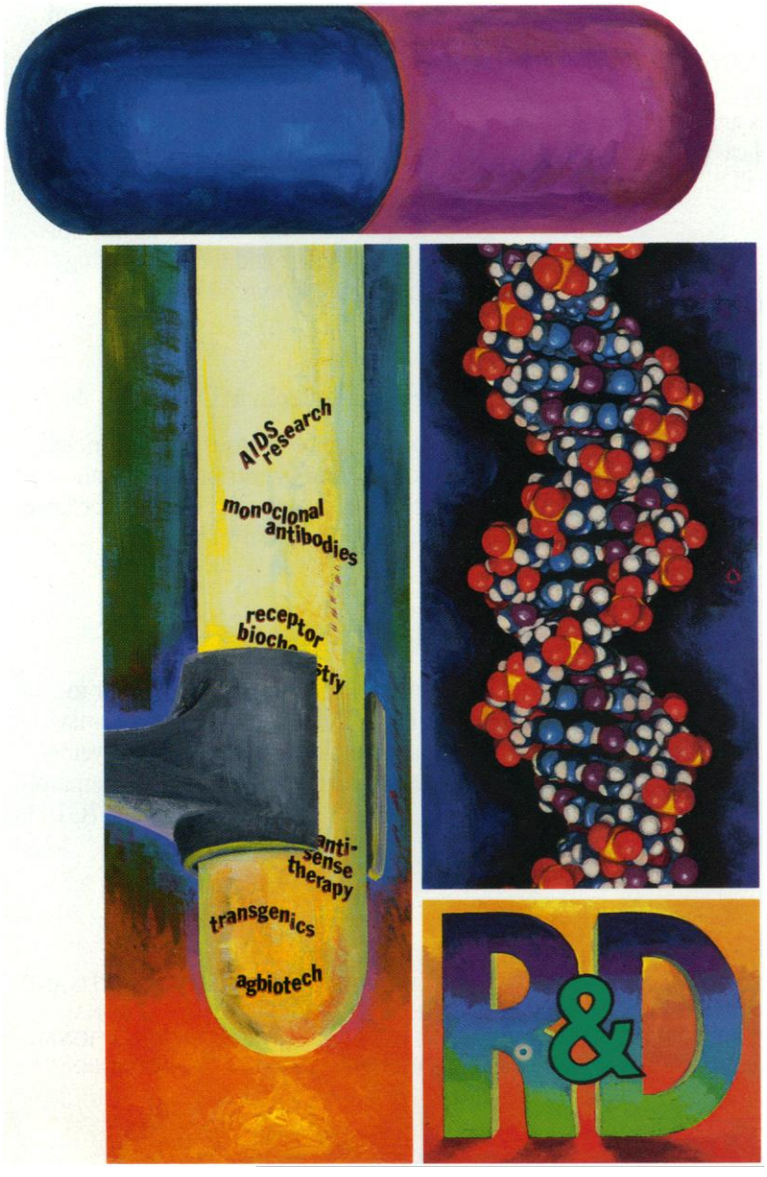
CAREERS IN PHARMACEUTICALS & BIOTECHNOLOGY

BY JOHN TIMPANE



There's a mythical map of the scientific world that, until recently, many scientists seemed to carry around in their heads.

On one side stood a tall Ivory Tower, separated by a wide river, labeled *Rubicon*, from a large Corporate Park. Denizens of one realm looked down on denizens of the other. Academics regarded industrialists as "not good scientists," while industrialists thought of academics as "Ivory Tower snobs."

This mental map, itself something of a myth, is now out of date. Rather than tearing it up, though, we would do better to draw a series of bridges across the imagined river. Cooperation between the academy and the company is generations old. Tower and corporate park are not mutually exclusive domains: they have long shared—and competed for—the best scientists. As of 1992, federal funds are receding. The pharmaceutical industry, a mighty, established giant, now has an intense little brother, the biotechnology industry. These two are responsible for a growing number of career opportunities for life scientists. While the PhD "drought" is not universal (each year 1,400 physics PhDs have to squeeze into 700 jobs), it is site-specific. One relatively thirsty field is the life sciences, where, as the supply of PhDs holds steady, the demand continues to grow. Qualified researchers enter a job market both larger and more competitive than it has ever been.

Below, we take a look at the evidence for a shift toward industry for science PhDs, followed by a

John Timpane, PhD, writes frequently on the pharmaceutical and biotechnology industries.

Gene Therapy Recent Advances And

The National Institutes of Health is recognized as the world leader in human gene therapy. In the short time since this new therapeutic approach was used to treat a four-year-old girl suffering from severe combined immunodeficiency disease, NIH scientists have initiated a number of laboratory and clinical studies to evaluate the effectiveness of gene therapy in the treatment of cancer, cystic fibrosis, AIDS and other diseases. These efforts are evidence that the NIH will remain a leader in the application of gene therapy and in the basic research which will provide the foundation for future clinical applications.

Several laboratories which are involved in gene therapy studies anticipate openings for **post-doctoral fellows** in 1992. If you hold an MD, PhD or equivalent degree and would like to be considered for any of the following positions, please send a cover letter, curriculum vitae, bibliography and statement of research interest to the address listed with each position. In addition, please arrange to have letters of recommendation sent from three scientists who can provide an evaluation of your qualifications.

W. French Anderson, MD

Gene therapy for the treatment of ADA deficiency, cancer, AIDS, hemophilia and cardiovascular disease and the development of injectable/targetable systems, site-specific integration, and regulatable promotors. Molecular Hematology Branch (OE-12), NHLBI, Building 10, Room 7D18.

R. Michael Blaese, MD

Gene therapy of children with ADA deficiency and exploring uses of gene therapy for treatment of established cancer and for prevention and treatment of AIDS. Metabolism Branch (OE-12), NCI, Building 10, Room 6B05.

Barrie J. Carter, PhD

Development of adeno-associated virus for use as a vector for delivery of genes to specific tissues such as airway epithelium. Laboratory of Molecular and Cellular Biology (OE-12), NIDDK, Building 8, Room 304.

Harry L. Malech, MD

Gene therapy of Chronic Granulomatous Disease including retroviral expression of components of the human neutrophil NADPH oxidase. Laboratory of Host Defenses (OE-12), NIAID, Building 10, Room 11N113.

Arthur W. Nienhuis, MD

Gene transfer into hematopoietic stem cells in order to develop therapies for hemoglobinopathies, thalassemias and hematopoietic malignancies such as chronic myelogenous leukemia and multiple myeloma. Clinical Hematology Branch (OE-12), NHLBI, Building 10, Room 7C103.

At The NIH. Future Opportunities.

Ronald G. Crystal, MD

Using adenovirus vectors for *in vivo* gene transfer to internal organs, including the lung, liver, vascular system, gastrointestinal tract and skin, in order to treat hereditary and acquired disorders. Pulmonary Branch (OE-12), NHLBI, Building 10, Room 6D03.

David Dichek, MD

Application of gene transfer techniques to the development of therapies for human vascular disease, particularly thrombosis and focal vascular proliferation. Molecular Hematology Branch (OE-12), NHLBI, Building 10, Room 7D18.

Stephen E. Epstein, MD

Understanding the genetic basis of restenosis following angioplasty and development of therapies involving gene-based approaches to the inhibition of smooth muscle cell proliferation and migration. Cardiology Branch (OE-12), NHLBI, Building 10, Room 7B15.

Steven A. Rosenberg, MD, PhD

Gene therapy of cancer has been initiated using viral vectors (retroviral and others) to insert multiple genes into lymphocytes and tumor cells. Gene expression in mammalian cells is also being studied. Surgery Branch (OE-12), NCI, Building 10, Room 2B42.

Additional Postdoctoral Fellowship Opportunities

For an on-line listing of additional postdoctoral openings you may access the NIH EDNET Bulletin Board's POSTDOC conference via modem (1,3014922221) or (1,8003582221). The settings for modem access are "7,Even,1". When connected to NIH, type in ",vt100" at the connect message, "F5E" at initial, and "AJL1" at account. Those interested in receiving a catalog featuring descriptions of NIH research laboratories and other post-doctoral opportunities may contact the Office of Education, Building 10, Room 1C129. Phone: 301-496-2427.

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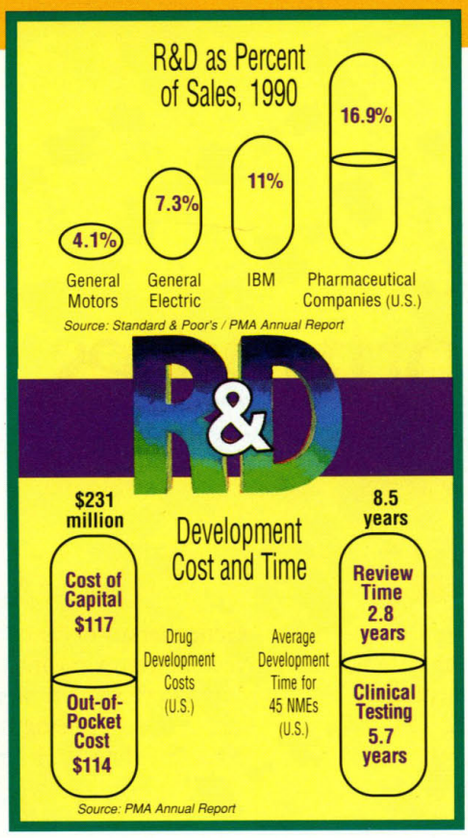
look at pharmaceuticals, biotech, and the decision-making process for the job-seeker. Then we will hear scientists tell us their stories and discuss how they made their decisions.

Overview: A Shift toward Industry

The past 20 years have seen a subtle, steady redistribution of employment for science PhDs. According to National Science Foundation data, academia is still the place where the greatest number of scientists work—230,932 as of 1989. It is estimated that by the year 2000, fewer than half of all scientists in the United States will work in universities and colleges. It's certainly trending that way. In 1975, according to the NSF, 58% of science PhDs were employed in educational institutions; by 1989 this figure had declined to 51.5%. Meanwhile, the proportion of science PhDs employed in industry rose from 25% in 1975 to 32.4% in 1989, when 145,148 scientists worked there.

The growth rate for employment in industry has outstripped that in academe for more than 15 years. Academic job growth averaged only 3.6% from 1975-1985, smaller than the average annual GNP growth for that period of 4.6%. Conversely, industrial job growth averaged 6.9% from 1975-1985, remarkable in light of the two and a half recessions during that period.

Involved in this redistribution is the shrinking role of the federal government in funding for basic research. According to *Standard & Poor's Industry Survey*, the government is still the greatest single source of funding, but its role has declined, from 60% in 1979 to 44% in 1990. Private funding has had to fill this gap. In 1989, private industry investment surpassed federal spending in basic health care research for the first time. Guess where much of that private money is.



Pharmaceuticals: Land of the Giants

Answer: the pharmaceutical industry, a land of sprawling international corporations that spend and earn billions in marketing health care products. In this Land of the Giants, they fight without gloves, and people pay a lot of money to watch. Worldwide sales have grown from $3.1 billion in 1965 to an estimated $63 billion in 1991.

Biotechnology and pharmaceuticals are two industries in which R&D is key. *Standard & Poor's* reports that the average U.S. manufacturer puts about 3% of its earnings back into research and development. The average medical technology company more than doubles that figure, at 6.2%.

But this figure is thrown into the shade by the towering 16.9% invested by drug companies. The largest of the pharmaceutical corporations, such as Hoechst, Bayer, and CIBA-Geigy, have R&D budgets of over a billion dollars a year. These companies are far from prodigal. Herman Saftlas, health care analyst for *Standard and Poor's Industry Survey*, writes that, compared with those in other sectors of the economy, the R&D efforts of drug and medical product manufacturers have led to "a relatively high degree of commercial success." Billion-dollar products are not rare. Glaxo's Zantac®, an anti-ulcer drug, is the current world champion, making $2.3 billion a year.

Profits are huge, anxieties are tremendous, expenses are colossal. As research questions become more complex, and as the FDA approval process becomes more and more tortuous, the R&D process becomes longer, more expensive, more tech-intensive. That is why the rate of new product development has slowed in the past five years. Costs are so enormous that even companies with great-looking balance sheets need to keep the "pipeline" filled with new products. Merck has at least two billion-dollar drugs: Vasotec®, an angiotensin-converting-enzyme inhibitor, and Mevacor®, a cholesterol-lowering drug. Yet Merck researchers are anxiously scrambling to prepare Proscar®, a drug that may help shrink enlarged prostate glands, for a billion-dollar market by 1996.

All of this leads to an increased need for researchers. Kym Goddu, personnel associate for Pfizer Central Research Division, points to the "declining population of scientists in general" and says that "R&D is the heart's blood" of the industry: "Demand is exploding dramatically. We're growing new research space, recruiting a large number of scientists, and they need to be the best scientists. For people

Top 15 Companies by Research and Development Expenditure

Rank 1990	Company	Group R&D ($ in millions)
1	Hoechst Group	1,668.9
2	Bayer Group	1,610.6
3	CIBA-Geigy Group	1,486.2
4	Eastman Kodak Co.	1,329.0
5	Imperial Chemical Industries	1,310.5
6	BASF Group	1,216.8
7	Roche Group	1,038.8
8	Rhone-Poulenc S.A.	949.6
9	Bristol-Myers Squibb	881.0
10	Sandoz Ltd.	869.1
11	3M	865.0
12	Merck & Co. Inc.	854.0
13	Johnson & Johnson	834.0
14	SmithKline Beecham	758.5
15	Eli Lilly and Co.	702.7

Source: Medical Advertising News

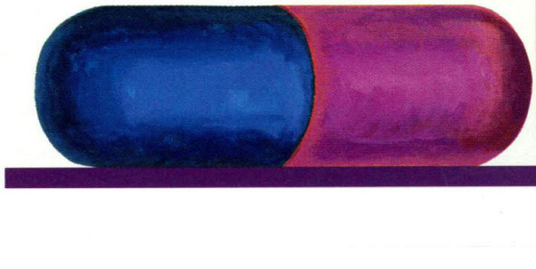


Illustration and design - Liz Vahlsing

qualified in our areas of need, the demand is great and the supply is limited." Daniel Vapek, senior vice president for research at Amgen Inc, agrees: "We can't find enough molecular biologists or protein chemists. There just aren't enough out there for right now or five years from now."

Who's needed? "Molecular biology at the receptor level is playing a bigger and bigger role in recent pharmaceutical advances," Goddu says. "There has been an explosion in large-molecule therapeutics."Andy Perlman, senior director of clinical research at Genentech (see his story below), says, "There's great interest in immunology and neurobiology." Susan Jenkins, associate director of human resources at Merck Research Laboratories, says, "Molecular biology is a current and future field of need."

Notes on the Numbers: Our figures here are to be regarded as servants rather than masters. Because of changes in questions and data-gathering techniques, NSF data from before and after 1985 may not be strictly commensurate. We compare figures from both periods only to furnish approximate conceptual guidelines. Industry data are courtesy of *Standard & Poor's Industry Survey* and the Pharmaceutical Manufacturers Association (PMA); while largely similar, these too may not be fully commensurate. Figures on salary ranges are from both the NSF and human resource managers at different companies. Again, we mix and match such figures only for the sake of furnishing conceptual guidelines.

The call is out for biochemists as well as protein chemists, biochemical engineers as well as molecular biologists of all stripes, receptor biochemists, cell biologists, and professionals versed in gene expression, cloning, and transgenics. Cell culture, fusion, and manipulation; tissue culture; molecular modeling; liposome and polymer engineering; biodelivery systems; human monoclonal antibodies—if it has made the news recently, someone somewhere is investigating its market potential.

That usually translates to its usefulness in human disease. Goddu says, "We're looking for people who can take their knowledge in a given area and apply it to a specific hypothesis, with the the ultimate goal being a novel therapeutic." Carol Marzetta, senior research scientist for Pfizer Central Research Division (see her story below), advises PhDs to "be thinking about the major disease markets—that doesn't sound very altruistic, but it's the case." Those fields include central nervous system disease (CNS products are the largest single market, with over one-fifth of pharmaceutical shipments), cardiovascular disease (currently 15% of all pharmaceutical shipments), arthritis, breast and ovarian cancer, osteoporosis, AIDS, Alzheimer's disease, and Parkinson's disease.

New Drug Filings with Food & Drug Administration

Year	Original INDs submitted	Original NDAs submitted	NDAs approved	New molecular entities
1990	1,530	98	64	23
1989	1,345	118	87	23
1988	1,337	126	67	20
1987	1,346	142	69	21
1986	1,623	120	98	20
1985	1,904	148	100	30
1984	2,112	217	142	22
1983	1,798	269	94	14
1982	1,467	202	116	28
1981	1,184	129	96	27
1980	1,087	162	114	12

IND-Investigational new drug. NDA-New drug application.

Source: PMA Yearly Report

Immunologists are very much sought after for research into AIDS, transplant rejection, and systemic effects of chemotherapy. "AIDS has meant a new interest in virology and the biochemistry of infectious disease," says Perlman of Genentech. Neurobiology continues to be in demand, with applications that include the treatment of depression, sleep disorders, schizophrenia, Alzheimer's, and Parkinson's. There continues to be a need for new CNS drugs such as sedatives, antidepressants, nonsteroidal anti-inflammatory drugs (NSAIDS), and other narcotic and non-narcotic analgesics. And pharmacology remains a dedicated pipeline.

Present and future needs: that's what industry is about. As the "graying of America" continues, so does the growth of geriatric health care. The Pharmaceutical Manufacturers Association (PMA) reports that 329 medicines are now in development to treat 45 diseases commonly afflicting older

"Demand is exploding dramatically. We're recruiting a large number of scientists, and they need to be the best scientists."

Kym Goddu, Pfizer

persons. Newly discovered diseases, or variations on familiar ones, can create immediate needs. For example, the recent epidemic of multidrug-resistant tuberculosis in New York City and other urban centers has created a sudden need for molecular physiologists. Thomas L. Copmann, assistant vice president for biotechnology and biologics for the PMA, reports that companies "have been calling us, saying, 'Where can we find these people?' "

And almost all the hot fields in biotech (see below) are hot in pharmaceuticals. Gene therapy may be the pharmacology of the future. After all, why use chemicals or synthetic proteins to treat a disease if you can turn it off at the source? Since the 1990s is the decade of the Human Genome Project, the largest cooperative biology project of all time, it may also be the decade in which gene therapy comes of age. Unlocking the human genome is expected to reveal the structure and location of a multitude of genes implicated in human disease. Says one industrial researcher, "The mere law of averages suggests that we're going to find a lot we can use." Perlman of Genentech uses one word to describe the Human Genome Era: "fantastic."

Biotech: A Decade of Reckoning

That brings us to biotechnology, a different kind of industry from pharmaceuticals. For all the press it has received, biotech is still comparatively new. As Vapek of Amgen puts it, "It's hard to recall, but heck—there was no biotech 15 years ago." Many obstacles have hindered the rapid growth that analysts have been expecting. These have included a snailish economy, government regulations, the incredible cost of research, and the long development time for products.

Still, since 1975, biotech has gone from nothing to a $2-billion market. As an absolute number, that may seem low—except that the market is expected to triple by 1994 and grow to $50 billion within this decade. Many investors believe this explosion has been assured by Washington's recent commitment to relax government regulations. Though sources of venture capital have dwindled recently, moneyed interest continues to look to biotech. In 1991, initial and secondary public offerings by start-up biotech firms raised more than $4 billion.

So far the greatest success has come in medical therapeutics and medical diagnostics, two areas that make up half of all market concentration. A dozen important

Science at Synergen

Synergen, Inc. is a young and rapidly growing research-based biopharmaceutical company located in Boulder, Colorado. We use the latest advances in recombinant DNA technology, molecular biology and manufacturing technology. Our focus is on the discovery, development and production of protein-based pharmaceuticals for the treatment of serious human diseases including inflammatory diseases, chronic skin ulcers and neurological disorders.

Several of our compounds have progressed through laboratory testing, preclinical development and are now in human clinical trials. Our first commercial scale manufacturing plant is scheduled for completion late this year.

We are a company comprised of highly creative and skilled individuals who thrive on challenge and change. We are currently seeking the following professionals to join our team. First consideration will be given to candidates who have related industry experience.

Ph.D. PROCESS BIOCHEMISTRY

This scientist will be responsible for the development of purification processes for new pharmaceutical proteins. A wide variety of experience in purifying and analyzing proteins is essential. Requirements include the ability to interact cooperatively and successfully with scientists from research and development, fermentation, analytical, engineering and formulations. A Ph.D. in biochemistry or related field is also required plus a minimum of 2 years Post Doctoral experience. Biopharmaceutical industry experience is greatly desired.

TOXICOLOGIST

Our toxicologists use *in vivo* models to test preclinical safety of anti-inflammatory agents, cytokines, binding proteins and neurotrophic factors. Other responsibilities include writing protocols for monitoring and interpreting contracted toxicology studies along with performing inhouse GLP toxicology studies. Demonstrated experience in toxicology and physiology and *in vivo/in vitro* model experimentation, and a Ph.D. or DVM/Ph.D. with a minimum of 2 years Post Doc., are required. First consideration will be given to candidates who have experience with immune hypersensitivity reactions and the FDA drug approval process.

QUALITY CONTROL / ANALYTICAL SCIENTIST

As a member of the QC/Analytical team, this scientist will validate analytical tests on biotech products, ensuring that all procedures follow FDA guidelines and cGMP regulations. A Ph.D. in biochemistry, at least 2 years of related experience, and a strong working knowledge of HPLC, gel electrophoresis, ELISA and DNA assays are required. Candidates with experience in Quality Control and FDA submissions will receive first consideration.

RESEARCH ASSOCIATES

Several of our groups have positions for Research Associates with degrees in chemistry, biochemistry or a biological science. Extensive experience in laboratory techniques such as protein purification, tissue and cell culture, ELISA and assay development, etc. are required.

Boulder, Colorado residents enjoy a community renowned for its beauty, culture and natural attractions...making Boulder a great place to live and work.

Please send your resume to: Director of Recruitment, Box SMA, Synergen, Inc., 1885 33rd Street, Boulder, Colorado 80301. We are an Equal Opportunity Employer.

NOTE: Synergen will have a recruitment representative at the Career Opportunity Showcase '92 at the BIOPHARM CONFERENCE, SAN FRANCISCO HILTON, June 8 and 9, 1992.

SYNERGEN

Share Our Worldwide Commitment To Discovery.

As one of the world's leading pharmaceutical companies, Eli Lilly and Company has a vision for tomorrow: to enhance the discovery of pharmaceuticals and expand our knowledge of medical research to benefit people the world over. We've had a direct presence abroad for more than 70 years, and today our products are available in more than 110 countries.

Supported by a research budget in excess of $700 million, our 4,000 research scientists and technicians are pursuing a wide range of important research projects. We're developing innovative therapies for cancer; cardiovascular, pulmonary and skeletal diseases; diabetes; CNS conditions, and bacterial and viral infections.

If you possess a degree in Biochemistry, Cell Biology, Analytical or Organic Chemistry, Molecular Biology, Pharmacology, or a related discipline and you share our commitment to the future, we invite your inquiry.

Lilly

For prompt consideration, please forward your résumé to: Corporate Recruitment, Dept. CIS-591, Eli Lilly and Company, Lilly Corporate Center, Indianapolis, IN 46285.

An equal opportunity employer.

Selected Publicly Owned Biotech Companies

Company	Principal business
Amgen	Uses recombinant DNA technology to make anti-anemia and other drugs
Biogen	Drugs for AIDS, heart disease, cancer and inflammatory ailments
Centocor	Manufactures drugs and diagnostics using monoclonal antibodies
Cetus	Interleukin-2 cancer drug, PCR diagnostics, and other products
Chiron	Growth factors, therapeutic enzymes and other drugs and diagnostics
Cytogen	Drugs and imaging agents for heart disease and cancer
Genentech	Produces thrombolytic and growth hormone agents through gene splicing
Genetics Institute	Recombinant DNA drugs for blood-related and other ailments
Genzyme	Enzymes, substrates used for R&D diagnostics and drugs
Immunex	GM-CSF and other immunological therapeutic products
Nova	Drugs and new delivery systems, focusing on CNS, pain and inflammation
Synergen	Protein-based drugs, focusing on inflammatory and neurological diseases and wounds
XOMA	Monoclonal antibody-based pharmaceuticals

Source: Standard & Poor's Industry Survey

genetically engineered therapeutic agents are now on the market. These include the synthetic insulin substitute Humulin®, marketed by Eli Lilly, and Genentech's Activase TPA®, a blood-clot dissolving agent. Amgen has licensed synthetic human erythropoietin to Ortho Biotech, which markets it as Procrit®. Amgen's own Neupogen® stimulates production of white blood cells. Again, 12 is not a large number, except that in 1990 alone, 18 new genetically engineered medicines were under FDA review, with another 80 in preclinical testing stages for the treatment of, among other diseases, AIDS, Alzheimer's disease, Parkinson's disease, blood-clotting disorders, and stroke. Clearly, this industry is poised for extremely rapid growth.

By definition, biotechnology seeks to employ the latest life-science techniques in creating commercial products. Consider the exciting research into colony-stimulating factors, in which immature blood cells are stimulated to proliferate and mature by a synthetic protein closely matching the body's natural stimulants to cell growth. Patients with bone marrow cancer, leukemia, and other kinds of cancer can benefit from red-cell stimulating proteins. And synthetic white-cell stimulating proteins may be extremely useful in the treatment of AIDS and other immunosuppressed states.

Animal research also has importance for human medicine. Using transgenic techniques, researchers have produced genetically engineered animals that are useful models for human disease. The "onco-mice," developed at Harvard by Philip Leder, are perhaps the best known of these. On the industrial side, genetically engineered pigs are now producing human insulin. Dow's engineered sheep give milk rich in enzymes for people with enzyme deficiencies.

Perhaps the most ancient of all biotech fields is agricultural biotechnology, also known as agbiotech. In 1971, a University of California researcher who shall remain nameless was nearly laughed out of his department because he suggested the possibility of combining porcine DNA with plant DNA to produce a photosynthetic pig. Think of the boon to developing countries! The confusion for vegetarians! The savings in feed cost! Just add sun, water, the occasional vitamin . . .) Today the technology and knowledge now exist to create, if not photosynthetic porkers, at least hardier, leaner, more productive animals and plants. (We do have low-fat pigs, low-cholesterol eggs, all-weather corn.) If you build a better critter, the world will beat a path to your door.

Transgenics is important in biotech, as is genetic recombination and protein chemistry. In this line, a fierce competition is on to produce the best synthetic bovine growth hormone. Research into novel animal vaccines has been an important concern for years at companies such as Merck—indeed, according to Jenkins of Merck, there is a continuing need for research veterinarians to aid in this quest.

Genetic and cell engineering may lead to better ways to fertilize crops and protect them from frost and pests. Frost Technology Corporation recently introduced Frostban®, a product to help crops withstand frosts. Mycogen Corporation is working with genetically engineered bacterial pesticides. Agricultural biotechnology also has an aesthetic (and commercial) side. Calgene Pacific recently revealed the genetic codes for rose pigments, which may make it possible to produce that dreamed-of wonder, the blue rose.

A third area is environmental protection. This field, at present the target of only about 4% of all biotechnological research, according to *Standard & Poor's*, is expected to burgeon rapidly along with the environmental needs of an increasingly crowded, increasingly polluted world. Oil-degrading microorganisms are being developed to break down harmful oil slicks into lighter grades of oil. Biosensory diagnostic kits can help detect the presence of environmental toxins. And don't forget biodegradability, another of those areas for which the name has arrived somewhat before the field. The need for biodegradable plastics, containers, and packing materials is huge, hurting, and permanent, and so is the need for scientists to create them.

The entire biotech palette is being eagerly sought after: cell engineering, cell culture, fusion, and manipulation; tissue culture; preservation engineering. DNA probe technology may someday help detect chromosomal defects. Gene-replacement research may help excise and replace abnormal and defective genes. Another approach to defective gene correction is anti-sense therapy, which involves decreasing defective gene expression by integrating small oligonucleotide competitors into them. Anti-sense techniques may help address the replication of viruses such as HIV. Plant cell tissue technology is in the midst of a great flowering. Escagenetics Corporation recently announced it was using cloned plant cell tissue to produce Taxol®, an anticancer drug previously available only from yew-tree bark. Before rain forests become a sad memory, botanists and biochemists are collaborating to study the possible medicinal uses of rain forest flora.

Another huge potential market-to-itself may be in human monoclonal antibodies. Some synthetic hybridoma cell tissues can produce specific antibodies that can target antigens on tumor cells. Monoclonal antibodies are now

Biopharmaceutical Leader

Somatogen, a rapidly growing biopharmaceutical company and a world leader in the development of a blood substitute, currently has exciting opportunities available for:

Patent Counsel
In-house patent lawyer with six plus years experience in biotechnology patent law. Outstanding opportunity to build patent law group from the ground up.

Technology Analyst
A Ph.D. in a biological or chemical field or an MBA with a strong background to perform both scientific and business analyses of potential new technologies of interest both in and outside the field of blood substitutes.

Toxicologist
This individual will have the opportunity to develop a toxicology department with responsibility for protocol development and coordination of all phases of pre-clinical toxicology studies.

The successful candidate will have a Ph.D. or an M.S. with 4-7 years pharmaceutical or contract lab toxicology experience either as a Study Director or Assistant Study Director. Prior experience with recombinant proteins and large volume parenterals is desirable.

Peptide Chemist
Responsibilities include synthesis and characterization of peptides and peptide analogs for a variety of uses, using manual and automated solid phase BOC and FMOC syntheses.

Applicants should have a B.S. or M.S. in Chemistry (preferably organic chemistry) and 2-3 years related experience. Experience in protein chemistry and protein-peptide interactions is preferred.

Expression Scientist
Requires a Ph.D. in Microbiology, Molecular Biology, Bacterial Genetics or related field, with an emphasis in studies of prokaryotic gene regulation. This individual will join our Strain Development program and participate in the design and development of expression systems for biotherapeutic products.

Recovery Development Engineer
Requires a Ph.D. in Biochemical Engineering or related field with 0-5 years experience in Solid-Liquid-Separations Technology. Alternatively, an M.S. or B.S. in F ering with 3+ years of experience in develop of recovery operations. This individual will join our Recovery Development group and participate in design and optimization of cell harvest, breakage and lysate clarification operations.

Fermentation Laboratory Manager
Requires a B.S. or M.S. in Microbiology, Biology, Engineering or related field with 3-5 years of laboratory experience. This individual will be responsible for operation, maintenance, scheduling and trouble-shooting of our fermentation services operation with 2, 10, 100 and 400 L fermentation equipment.

Purification Development Scientist
(Multiple Openings)
Ph.D. in Biochemistry or Chemical Engineering required, with 2-5 years experience in protein purification process development preferred. Responsibilities will be focused on exploration of traditional as well as novel purification technologies and their implementation in large scale operations, and transfer of new purification process technologies to Engineering and Manufacturing personnel. Group is multidisciplined and emphasizes a team approach to process development.

Purification Development Engineer
B.S. or M.S. in Chemical Engineering required, with 2-5 years experience in protein purification process development preferred. Responsibilities will include applied process development research, definition of process operating parameters and transfer of process technology to Engineering and Manufacturing personnel. Group is multi-disciplined and emphasizes a team approach to process development.

Somatogen's first product, a recombinant, genetically engineered human hemoglobin for use as a blood substitute, is in clinical trials. Somatogen's team of 150 employees were drawn to the company by its high quality science, the enormous medical potential for recombinant hemoglobin, and Boulder's stimulating university environment, appealing lifestyle and opportunities for recreation in a mountain setting.

A competitive salary and benefits package with equity complement these offers. Interested candidates may submit a resume and cover letter, with the job title of interest, to: *Nancy Borne, Manager of Professional Development*

SOMATOGEN

5797 Central Avenue, Boulder, Colorado 80301
An Equal Opportunity Employer

REDEFINING THE FUTURE OF GENETIC TESTING.

A commitment to bringing new technology to our field. The most comprehensive array of genetic tests. The highest standards of service. This is IG Laboratories, the majority-owned subsidiary of Genzyme, serving critical healthcare testing needs across the nation. Our goal is to be the leader in genetic testing. We have the people, the values, the commitment, and the financial strength to accomplish this goal. Join IG - the Genetic Testing Company.

Senior Scientist - PCR

We seek a senior researcher with a strong genetics background to develop PCR based assays to detect human genetic diseases. Tests will be immediately employed in clinical laboratory applications with a direct impact on patient care. Will also have the opportunity to collaborate on basic research projects to identify and characterize human disease genes.

Requires a Ph.D. and 5-10 years' experience in genetics, specifically in the development of PCR based assays to detect single base pair changes in human disease genes. Extensive PCR research experience is essential.

Research Scientist

Develop *in situ* hybridization based assays for the detection of chromosome abnormalities in pre-implantation embryos. Requires a Ph.D. with experience in *in situ* hybridization, pre-implantation genetics, and embryo biopsy and analysis.

Research Scientist - Biophysics

As part of our molecular genetics group, will be involved in the evaluation/development of multi-color fluorescence *in situ* hybridization assays. A key focus will be the use of this technology in our fetal cell separation program. Requires a Ph.D. in Biophysics or related field and extensive experience in the chemistry and physics of fluorescence. A working knowledge of optics and/or DNA biochemistry is desirable.

Research Associates - *In situ* Hybridization

Support development and technology transfer of *in situ* hybridization based diagnostic assays for chromosomal defects. Requires BS/MS with experience in molecular biology and *in situ* hybridization.

Research Associates - FISH

Be part of a team developing enhanced fluorescent *in situ* hybridization technology for use in prenatal diagnosis of maternal blood. Involves optimization of FISH parameters, sample preparation and analysis. One position requires an MS/BS degree with strong experience in molecular biology and FISH. Cytogenetics background would also be useful.

A second position is available for an individual with an MS/BS degree and experience using both antibodies for cell enrichment and fluorescence microscopy.

IG offers an excellent compensation and benefits package including incentive stock options, a 401(k) plan with a company match, and extensive insurance plans. Our state-of-the-art facility is located 30 minutes west of Boston and has its own lecture hall, fitness facility, and library. Please send your resume to: Vice President, Human Resources, Dept. S58, IG Laboratories, One Mountain Road, Framingham, MA 01701.

An equal opportunity employer.

INTEGRATED GENETICS®

IG Laboratories, Inc.

employed to help treat organ transplant rejection, as in Ortho Biotech's Orthoclone OKT3®, marketed for heart, liver, and solid organ transplants. Another active area is microbiologic drug delivery systems, in which monoclonal antibodies act as tiny ferries carrying drugs to specific target tissues.

Profile of the Versatile Scientist

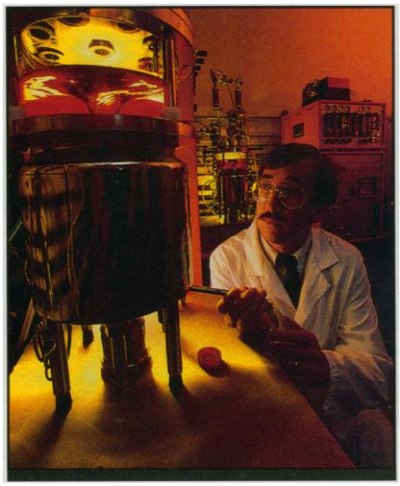
"What we're looking for," says Vapek of Amgen, "are people who are really no different from assistant professors at a university. Cutting-edge is what we expect. Molecular biologists are hard to find enough of. Protein chemists, too. The list is the old familiar one: cellular and molecular biology and biochemistry, protein chemistry, purification, characterization, functional analysis, crystallography. We want people who want to do science."

But not just any people. Goddu of Pfizer gives a representative profile: well-trained PhDs in a traditional academic background, "at least one, mostly two to five years of postdoctoral research, with a record of accomplishment as demonstrated through publications." Jenkins of Merck agrees that "excellence as demonstrated in continued publication is important to us—and we expect our people to continue publishing." Far from being a handicap, second postdocs are seen as advantageous in many areas. "People who do second postdocs are indicating a broad range of interests in their chosen work," Goddu says.

Nuts and Bolts: The Decision-Making Process

The science of the future (meaning science now) will be (meaning is) interdisciplinary. "For more than a decade now," says Copmann of the PMA, "we've been hearing about the need to be interdisciplinary, to be able to cross these imaginary boundaries among chemistry, physics, biology, and the other sciences." It has long been this way. Martin Schwartz, an associate member of the department of vascular biology at Scripps Research Institute, was graduated from Stanford University in 1979 with a doctorate in physical chemistry. In those days he referred to himself as a "biophysical chemist," which, he was fond of saying, just as easily could have read "biochemical physicist" or "physical biochemist."

For years, science PhDs have been advised to tailor their degree programs to anticipate market needs. All the more so now, when both federal funds and industrial R&D are increasingly market-driven. Says Marzetta of Pfizer, "It doesn't matter whether you're in academia or in industry—you need to look ahead and find a salable focus." One thing that is salable is a specific balance between in-depth training and versatility. Industry needs skills, such as genetic engineering, that apply in a broad range of research settings. PhDs with such skills should be ready to become versatile.



Biotech research has yielded products such as synthetic erythropoietin.

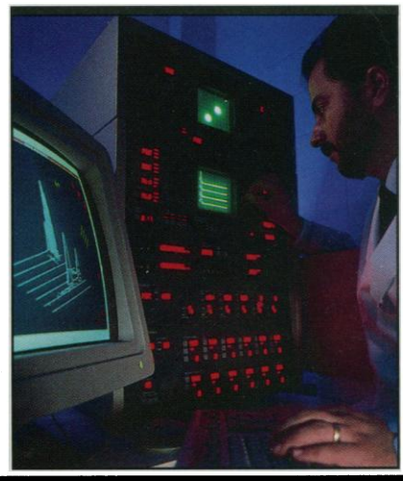
"Substitutability" may be an ugly word, but it's a necessity in an industry going through some billion-dollar growing pains.

In the past, industrial researchers could teach themselves new techniques and disciplines on the job—and companies still often encourage or require researchers to take courses in the latest thing. But as the growth rate of knowledge itself explodes, true interdisciplinary experience becomes more and more of an advantage for today's job applicants. In many cases, it's already a requirement. Read this snippet from a recent industrial biotech advertisement:

> *Position requires a PhD and/or MD with 2 or more years experience in one or more of the following: molecular biology of the skin; papilloma virology; design of human and/or animal model systems; 3-D immune receptor structure; computer-aided molecular modeling . . .*

And should be able to juggle.

Brotherly love: Many pharmaceutical companies are sprawling international concerns with billion-dollar budgets. Biotechnology companies tend to be much smaller, somewhat more like academic departments—and, perforce, much more patient. Biotechnological research often starts out as a brilliant, risky, expensive guess—which is why most such companies are in a constant quest for venture capital. An entrepreneurial attitude is all. A common practice is the "big brother" relationship, in which a biotechnology firm will be funded by a larger pharmaceutical concern in return for the right to license and market any commercial applications. Big brother needs little brother: it's often cheaper for a pharmaceutical company to contract out basic biotechnology research than to set up a biotech department in-house. Little brother needs big brother: biotech companies are constantly looking to start a beautiful friendship with a bro in the bucks. Such alliances help strengthen big brother in the market and help little brother grow.



Machines like this cell sorter put the "tech" in biotech.

Pluses and Minuses

Both industry and academia have pluses and minuses as career targets. The wisdom of a given choice depends on the person making the transition, the target company, and the circumstances of research. That first set of variables (personal preferences, values, and goals) is the most important one. PhDs eyeing industry—and established academics considering the switch—should be frank with themselves. Marzetta of Pfizer says, "At some point in your progress, you need to elucidate to yourself what you want to do and why."

Philosophy

A good game to play is "What's My Philosophy?" Academics and industrialists look at scientific research differently. As one scientist with experience in both camps puts it, "It's a difference in how the mind works." Academic research seeks to add to the store of knowledge; industrial research seeks to take a problem from research all the way through to production. Since the unexamined career choice is not worth making, the PhD job-seeker should take a long, hard look at this philosophical divergence.

Photos courtesy of Ortho Biotech; Photographer: Ted Horowitz

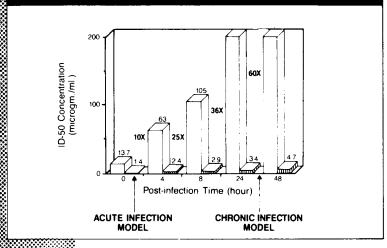
CONVENTIONAL THINKING IS: ANTISENSE WON'T WORK.

Oligonucleotides:

- Do not enter cells
- Are unstable
- Are non-selective

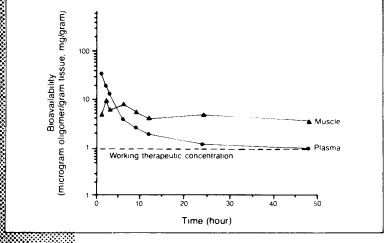
WE KNOW DIFFERENTLY.

GEM 91 IN ACUTE AND CHRONIC HIV INFECTION MODEL



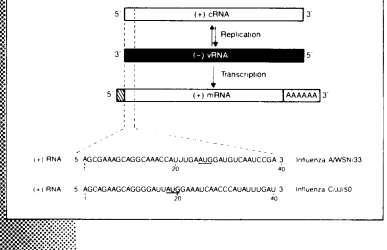
Comparitive inhibition of HIV replication by an unmodified oligonucleotide (solid bars), and an oligonucleotide having modified sugar-phosphate backbone, a phosphorothioate. The inhibition of HIV by the phosphorothioate is definitive, proving that the modified oligoneucleotide has indeed passed through the cell membrane to reach the site of action, targeting and blocking the HIV gene critical to the replication of the AIDS virus.

TISSUE DISTRIBUTION OF GEM 47 IN MOUSE (30 MG/KG I.P.)



Pharmacokinetic study of oligonucleotide phosphorothioate shows that after administration of a single dose (either intravenously or intraperitoneally), presence was found in most of the tissues for up to 48 hours. Appx. 30% dose was excreted in urine within 24 hours, irrespective of the mode of administration. In most organs, oligonucleotide degradation was up to 15%; in kidney and liver, up to 50% degredation was observed in 24-48 hours. Therapeutic dose of oligonucleotide phosphorothioate (based on tissue culture) was present in most organs up to 48 hours after a single administration.

INFLUENZA VIRUS



Oligonucleotides tested for antiviral activity against influenza virus, depicting the three types of RNA present in infected cells, complementary, viral and messenger. The oligonucleotides were synthesized complementary to AUG site. Sequence specific inhibition of influenza C virus was 97% effective with an exact match, the effectiveness decreasing symmetrically with the numbers of mismatches. The high degree of success in specifically targeting gene sequences demonstrates the selectivity, and subsequent elimination of toxic reactions in antisense activity.

From the initial discovery of transfer RNA and its complementary codon trinucleotide of messenger RNA, to the subsequent deciphering of the genetic code, the therapeutic potential of the "hybridon" or "antisense" oligonucleotide concept has been too compelling to overlook. And now, Hybridon has taken decades of research to the point where we've systematically refuted each argument put forward to discredit antisense.

In terms of stability, cellular uptake, and selectivity, Hybridon has developed highly successful antisense oligonucleotides — our lead genetic targeting compound, GEM 91, which will be used to halt HIV-infection, is expected to reach human trials by the end of 1992.

BIOLOGICAL SCIENCES (PhD's)

Virologists Three years' experience in viral infectivity assay, evaluation of antiviral agents, immuno-chemical and chemical assays in virology and retrovirology. *Dept. BS/V.*

Pharmacokineticist Experience in biopharmaceutics, biochemical pharmacology or related drug kinetics and at least five years in pharmacokinetics, pharmacodynamics modeling and drug metabolism. *Dept. BS/P.*

Biochemist Must have experience to establish protocols and manage assays of biological and enzymatic activity and analytical bioassays. *Dept. BS/B.*

Toxicologist/Pharmacologist A hands-on and administrative position, requiring five years' experience in GLP drug toxicology/pathology evaluations. *Dept. BS/TP.*

Cell Biologists Cell biologists or immunologists preferably with three years' experience for in vitro and in vivo assays of effects of oligonucleotides on cell dynamics and kinetics. *Dept. BS/CB.*

Ribozyme Research Requires a background in the chemistry/biochemistry of nucleic acids and experience of kinetic studies with ribozymes or chemical synthesis of modified oligonucleotides or the molecular biology of RNA. *Dept. BS/RR.*

CHEMICAL SCIENCES (PhD's)

Oligonucleotide Chemists Experience in nucleoside, nucleotide and oligonucleotide chemistry necessary. Experience in the area of carbohydrate, heterocyclic or phosphorus chemistry desirable. Candidates should be familiar with related synthetic and analytical techniques. *Dept. CS/OC.*

Oligonucleotide Analytical Chemists Experience in chromatographic and spectroscopic techniques related to nucleic acids is necessary. *Dept. CS/OA.*

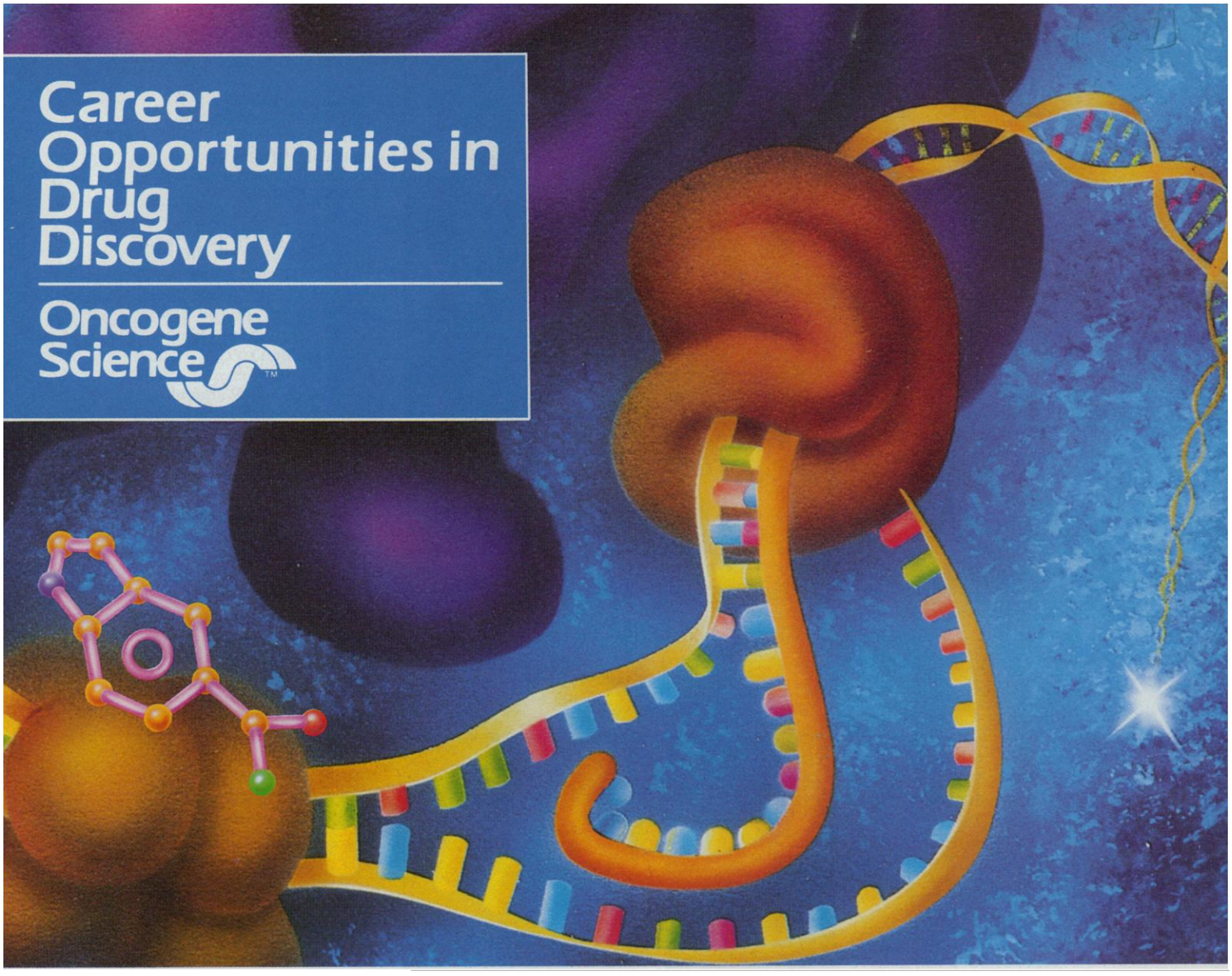
Oligonucleotide Scale-up Chemists Experience in solid phase synthesis of oligonucleotides is necessary, knowledge of computer software applications to production is desirable. *Dept. CS/OS-UC.*

RESEARCH ASSOCIATES

We have a number of positions available for applicants with a BS or MS and experience in molecular biology, biochemistry, bioanalytical chemistry, virology, statistics and chemistry. *Dept. RA.*

Collaborate with our outstanding team of scientists to expand on antisense technology, and bring our products to market. We offer a highly competitive salary and benefits package, as well as a convenient location in the Massachusetts Biotechnology Research Park. Please send your C.V. to: Hybridon, Human Resources Manager, One Innovation Drive, Worcester, MA 01605. An equal opportunity employer.

Hybridon



Career Opportunities for Research Scientists

Oncogene Science is continuing to expand its drug discovery research and development programs. By combining molecular and cellular biology with unique laboratory robotics, we are leading the way in the discovery of new small molecule pharmaceuticals for the treatment of cancer and cardiovascular disease. Several positions are now available at both entry and senior levels:

Molecular Biology

We are seeking several candidates with Ph.D.s in Molecular Biology to join our drug discovery team. Applicants with a strong background in the regulation of gene transcription are encouraged to apply.

Cell Biology

Two Ph.D. cell biologists are sought to join a multidisciplinary drug discovery team. The successful candidates will be responsible for development of cell-based screens, follow-up studies on lead compounds, and determination of the mechanism of drug action.

Protein Biochemistry

Ph.D.s with strong backgrounds in protein chemistry or enzymology are encouraged to apply. Individuals with experience in the analysis of oncogenes and tumor suppressor genes are preferred.

Drug Discovery

We are seeking Ph.D.s with at least 4 years of postdoctoral research experience in pharmacology, medicinal chemistry, or biochemistry to head small teams of scientists targeting the role of specific genes in various disease states. Good computing skills will be required.

Oncogene Science is located on Long Island with easy access to the major academic institutions in New York City.
Our compensation and benefits programs are very competitive. Qualified candidates should send their resumes, including a list of publications and references to:

Oncogene Science, Inc.
Human Resources Dept.
106 Charles Lindbergh Blvd.
Uniondale, New York 11553

An Equal Opportunity Employer

Pharmaceutical and biotechnology companies offer scientists the chance to work across disciplines toward a common goal.

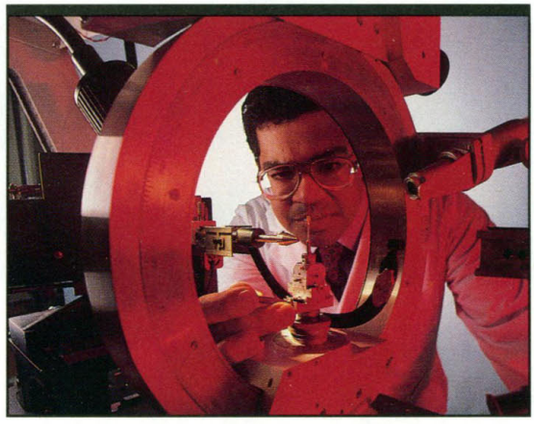
William Rutter, professor emeritus of biology at the University of California at San Francisco and chairman of Chiron Corporation, puts the choice beautifully: "On the academic side, PhDs should examine their own capabilities and talents, as well as their ability to compete for research grants. They should consider their willingness to deal with the ups and downs of academic life, the almost inevitable teaching commitments, the relationships with students, the entirety of positives and negatives of the academic enterprise. It's overwhelmingly positive, I think, but people should enter it knowing all sides.

"On the industrial side, people should examine their ability to work in groups, to be a team player as well as a leader, to like a progression. They should be able to appreciate the romance of the development of a product, from the initiation of an idea to the identification of product possibilities.

"That romance, of solving problems in a commercial environment, is a very attractive force. And then there is the stability of jobs, the fact that they pay well, and the fact that they can involve some of the best science being done today."

"At some point in your progress, you need to elucidate to yourself what you want to do and why."

Carol Marzetta, Pfizer



Industry's move toward basic research has created new career options for scientists dedicated to benchwork.

Salary

The word is that industrial scientists are paid better than academic scientists. Well, on the average, they are. Rutter puts it best when he says that "salaries in industry are definitely better, if not spectacularly so." As of 1989, according to National Science Foundation figures, the median salary for a life scientist in industry was $61,500, compared to $51,200 for a counterpart in academe. A familiar rumor that entry-level salaries in pharmaceutical and biotech companies can run $10,000 to $30,000 above entry-level academic salaries is confirmed both by statistics and by an informal and unscientific telephone poll to market researchers. Starting academic salaries run in the mid-30s (see below). In industry, on the other hand, the 50th percentile for pre-postdoctoral PhDs is *already* $45,500, and first-year salaries after one postdoc can range between $52,000 and $59,000.

Academia has been fighting back. Cindy Bulens, manager of corporate compensation for Amgen, reports that in her recent experience in competing for good scientists, "we're seeing that academic institutions are willing to make up the gap to get or keep good people, and that's a trend that we think may continue." This decision to get competitive is an institution-by-institution phenomenon, and it may take a while to show up on national averages. Stay tuned.

What is truly striking about salaries is not the $10,000 average disparity: it is the average time needed to reach the average and beyond—that is, the comparative promotion tracks. Among academic researchers in 1989, the average salary among those with less than five years' experience was $36,600; one did not reach the $50,000 question until after 10 to 14 years of experience, and the top average was $75,000, which took 35 years or more. In industry, by contrast, the maturity curve for PhDs five years after their degree is already $51,000. Higher, headier senior researcher salaries of $70,000 and more are available at many companies within a decade. Note also that most companies have two separate and parallel career tracks: researcher and managerial. The latter tends to be paid better, with performance-related bonuses that further increase the manager's wages.

On the academic side, such figures do not include grant monies. Neither side includes the dollar value of benefits packages, which are generous in both sectors. Here again, industry may have an edge, since researchers often are given generous stocks and stock options upon coming into the firm; this is especially true in biotech companies eager to enlist good talent in the entrepreneurial grail quest.

From the Halls of Academia

What academia offers is the opportunity to be left alone. "Academe—and I mean this with admiration and some envy—is the last great bastion of the independent candy store," says Vapek of Amgen. Scientists who want to be alone will want to get tenure. Because academic science departments pre-select their entry-level researchers, it's often clear quite early whether or not the hurdle of tenure will be cleared. Beyond the clearing, the rise can be slow, and pay increments, though satisfying, may be few, or much delayed, or unclearly linked to specific achievements.

Nor is the tenure track always smooth. In many academic research situations, all you get with an appointment is space; you must find the money yourself. Grantsmanship thus becomes a permanent part of the researcher's skills, all the more in difficult financial times, when the lab that brings in grant money stays and the lab that only breaks even goes. What was once the signal attraction of the academic life—security—has now been reduced by the unpredictability of the funding process. Some researchers like applying for grants; some hate it.

Top photo courtesy of Ortho Biotech; Photographer: Ted Horowitz / Bottom photo courtesy of Merck & Co., Inc.; Photographer: Robert Krist

To the Shores of Industry

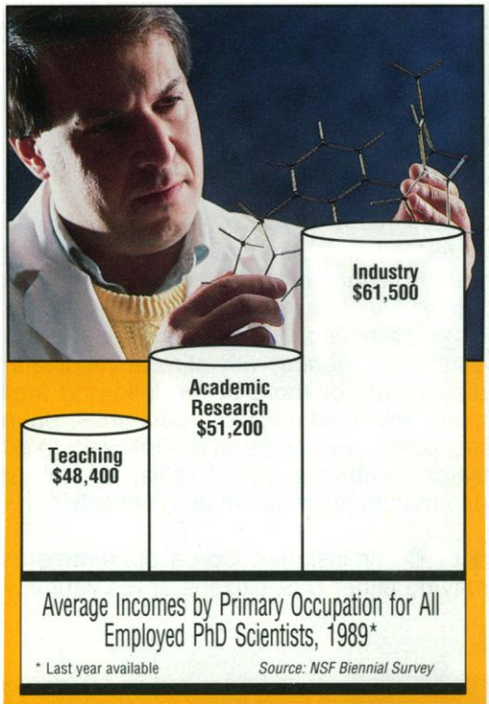
Corporations were invented for the comfort of numbers. Those who enjoy being part of a team, each of whose members is working toward a common goal through research, might enjoy a career in biotechnology or pharmaceuticals. Says Goddu of Pfizer, "People who come into the pharmaceutical industry have to want to be drug-hunters, to be a member of a team of dedicated professionals involved in the drug discovery process." Research in exciting and new areas is often encouraged. What makes these areas exciting, after all, often is their commercial application. "In that sense," says Vapek of Amgen, "we really are looking for people to function as creative, independent scientists—those are the people we are competing with the universities for."

Industrial science yields the same rewards that all business is said to yield: the satisfaction of seeing the doable and getting it done. Organizational skills and business acumen are highly valued. (On the other hand, don't bother picking up an MBA with the PhD. "We want good scientists, first and foremost," Vapek says. "When somebody brings a *Wall Street Journal* into the job interview, we start worrying.") Many people find that they like being managers, shepherding projects from start to finish. As Mary-Dell Chilton, a plant molecular biologist at CIBA-Geigy, says, "You have to be interested in *making it work* and in getting other people to make it work."

A main attraction is the satisfaction of doing research that can directly benefit people. Successful pharmaceutical research may result in novel ways to attack old bugs. One example is the quinolone antibiotics, which kill pathogens by inhibiting DNA gyrase, thus leading to cell lysis. New wrinkles on tried-and-true products are similarly valuable. A good example is the azalide antibiotics, which, thanks to a tweak in the chemical structure of erythromycin, possess a broader spectrum and improved side-effects profile. Another is Du Pont Pharmaceuticals' Sinemet-CR®, a new version of Sinemet®, an antiparkinson drug. The new version delivers dopamine in a new fashion, via a sustained-release matrix, in the attempt to avert some of the cumulative side effects of antiparkinson therapy. And important pharmaceuticals such as Burroughs Wellcome's AZT® can help combat new-found diseases. In a direct, humanitarian sense, these achievements alleviate symptoms and ease suffering.

Excellence is rewarded with recognition, both in the company and in the profession as a whole.

Industry can usually offer a larger number of career-related awards. Hierarchy motivates. Raises, bonuses, and promotions are in many cases more timely and more directly related to specific achievements than analogous rewards can be in academe. Industry does not require the heavy obligation to committees and teaching that often characterizes an academic life. And scientists don't have to look for the money themselves. Success can lead to recognition both within the company and in the scientific community. Even failures are rewardable, since establishing what does not work often narrows the search for what does—as well as sparing the company millions of dollars on dead-end research.



Continued publication is rewarded, and many firms pay for membership to professional organizations and foot the bill for travel to conferences. Many encourage periodic sabbaticals, continued education, and enrichment leaves. Many offer externships in which researchers alternate between the industrial lab and the university, picking up new knowledge and skills only academic work can provide. Finally, should one get homesick, industry tries hard to make their former academicians feel at home. Several companies, such as SmithKline Beecham, have built extremely collegiate research campuses that, in terms of resources, landscaping, even the names of buildings, recall the *nemora gelida* of academe.

But business, for well and ill, is business. Corporations, by and large, value team players, and teams are not known for being prone to risk-taking. Pure science can clash with commercial exigency. "In pharmaceuticals, research is often very focused," says one industrial researcher. "Market dynamics drive R&D decisions."

Then again, the once widespread prejudice against industrial science is fading fast. Research with a company's name in the funding box is subject to the same rigorous standards of design and reproducibility that academic-based research must meet. An increasing number of scientists appear to believe that if your work can meet those criteria, it doesn't matter where it's done.

Crossing the River

No Rubicon separates the university and the corporate park. As it stands, the two realms are increasingly interdependent. Industry needs the university for discovery and innovation; the university needs industry for development and marketing. Both sides grant that they need each other. Says Goddu of Pfizer, "The pharmaceutical industry wants and needs people to do academic work. That's the training

Top photo courtesy of Johnson & Johnson; Photographer: Philip W. Smith / Bottom photo courtesy of Ortho Biotech; Photographer: Ted Horowitz

PHYSICIANS

CHALLENGING EMPLOYMENT OPPORTUNITIES IN BIOTECHNOLOGY

DHHS/PHS/FOOD AND DRUG ADMINISTRATION
CENTER FOR BIOLOGICS EVALUATION AND RESEARCH

The Center for Biologics Evaluation and Research **has immediate openings for a number of outstanding PHYSICIANS** interested in a challenge by participating in the development and approval process for new biotechnology-derived products. The primary responsibility of the Center is to review the safety and efficacy of vaccines, blood products, certain diagnostic products and other biological and biotechnology-derived human products. In conjunction with regulatory and research responsibilities, the Center statistically evaluates clinical and preclinical studies of human biological products and vaccines and epidemiologically evaluates post-marketing studies and adverse biologics reactions. Physicians will serve as medical reviewers on multidisciplinary scientific teams of highly skilled professionals. Some positions offer the unique opportunity to conduct biomedical research in combination with review responsibilities. These positions have a high degree of independence and involve complex medical, scientific, and regulatory issues. Opportunities for professional development may include further training, attendance at scientific meetings and conferences, and clinical activities.

Qualifications: Candidates must have completed all requirements for a Doctor of Medicine Degree from an accredited institution. Graduates of foreign medical schools must submit a copy of their permanent Educational Commission for Foreign Medical Graduates (ECFMG) certification. Candidates should be board eligible or certified in a primary speciality or have completed at least four years residency training or possess equivalent experience. A background combining research experience with clinical medicine is preferred along with specialty training and expertise in one or more of the following areas: oncology, infectious diseases, hematology, rheumatology, epidemiology, pediatrics, pulmonary diseases, allergy, immunology, parasitic diseases, pathology or related disciplines. In addition, candidates should have highly developed analytical, written and oral skills, as well as the ability to research problems and issues and to use mature judgment in problem solving.

Candidates for Civil Service or Commissioned Corps appointments must be U.S. citizens. Candidates for Fellowships may be either U.S. citizens or resident aliens eligible for citizenship within four years.

Location: Offices and laboratories are strategically located on the campus of the National Institutes of Health in Bethesda, Maryland, or in close proximity to the campus.

Salary: Civil Service salary range for GS-13 through GS-15 is $56,990 to $87,784. Fellowship salary range is $38,909 to $70,850. Salary, benefits, research support, and level of responsibility are commensurate with education and experience. Some positions may include a Physicians' Comparability Allowance. Positions may also be filled by appointment in the U.S. Public Health Service, commissioned Corps, with commensurate salary and benefits.

How To Apply: Interested candidates should send an Application for Federal Employment (SF-171) and/or current detailed Curriculum Vitae along with bibliography, statement of regulatory/research interest, names of three references, and date of availability to:

FDA/Center for Biologics Evaluation and Research
Attention: Biotechnology Physician Recruitment-A
Building 29, Room 104, HFB-32
8800 Rockville Pike
Bethesda, Maryland 20892

To receive consideration under this announcement, applications must be received by **Friday, June 19, 1992.**

FDA IS AN EQUAL OPPORTUNITY EMPLOYER AND HAS A SMOKE FREE ENVIRONMENT

CHALLENGING POSITIONS IN BIOMEDICAL SCIENCE
GM-14/15

CHIEF, Laboratory of PEDIATRIC DISEASES
CHIEF, Laboratory of RETROVIRUS RESEARCH
Division of VIROLOGY, Office of Biologics Research
Center For Biologics Evaluation And Research
DHHS/PHS/Food And Drug Administration

The Food and Drug Administration (FDA), Center for Biologics Evaluation and Research (CBER), Division of Virology, invites applications for **Chief, Laboratory of Pediatric Diseases** and **Chief, Laboratory of Retrovirus Research**, both located in Bethesda, Maryland.

The Laboratory of Pediatric Diseases conducts research into major vaccines for prevention of childhood diseases, e.g. live and inactivated poliovirus vaccines, measles, mumps and rubella vaccines and is responsible for scientific and technical review of vaccines for prevention of these infections, as well as other vaccines.

The Laboratory of Retrovirus Research conducts research into the biology and immunology of retroviruses, especially HIV, and is responsible for scientific and technical review of products for prevention and treatment of these infections.

This is a supervisory position for a Medical Officer, or Biologist, Microbiologist, or Chemist. Duties include planning and implementing research projects; testing of vaccines and other materials; reviewing Investigational New Drug (IND) Applications and Product License Applications; reviewing ongoing research in the laboratory; proposing contracts for specialized laboratory test procedures; and providing advice and counsel.

Qualifications: Basic qualifications include a background in Biology, Microbiology, or Chemistry. For Medical Officers, a background in virology and/or infectious diseases is desirable. Graduates of foreign medical schools must submit a copy of their permanent Educational Commission for Foreign Medical Graduates (ECFMG) certification. Specific college level coursework is required. In addition, specialized experience or higher level graduate education will be required for higher graded positions. U.S. Citizenship is required.

Salary: At the GM-14 level, salary range for biologist, microbiologist, and chemist is $54,607 to $70,987, and $63,707 to $80,087 for physicians. At the GM-15 level, salary range for biologist, microbiologist, and chemist is $64,233 to $83,502, and $68,515 to $87,784 for physicians. Physicians may also be eligible for a Physicians Comparability Allowance up to $20,000 per year. Salary is commensurate with education and experience.

Positions may also be filled by appointment in the U.S. Public Health Service, Commissioned Corps, with commensurate salary and benefits. Candidates for this program need to meet Commissioned Corps appointment standards.

How To Apply: Applications for Federal Employment (SF-171) MUST be received no later than JULY 10, 1992. For further information on where and how to apply, and to obtain appropriate forms, call Ms. Blumenthal on 301-496-5394.

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SCIENTISTS
CHALLENGING EMPLOYMENT OPPORTUNITIES IN BIOTECHNOLOGY

DHHS/PHS/FOOD AND DRUG ADMINISTRATION
CENTER FOR BIOLOGICS EVALUATION AND RESEARCH

The Center for Biologics Evaluation and Research **has immediate opendings for a number of outstanding SCIENTISTS** interested in a challenge by participating in the development and approval process for new biotechnology-derived products. The primary responsibility of the Center is to review the safety and efficacy of vaccines, blood products, certain diagnostic products and other biological and biotechnology-derived human products. In conjunction with regulatory and research responsibilities, the Center statistically evaluates clinical and preclinical studies of human biological products and vaccines and epidemiologically evaluates post-marketing studies and adverse biologics reactions. Scientists will serve as reviewers on multidisciplinary scientific teams of highly skilled professionals. Some positions offer the unique opportunity to conduct biomedical research in combination with review responsibilities. These positions have a high degree of independence and involve complex scientific, and regulatory issues. Opportunities for professional development may include further training and attendance at scientific meetings and conferences.

Qualifications: Doctoral level degrees in biological or physical sciences, pharmacology, toxicology, or related disciplines along with advanced training and/or expertise in one or more of the following areas is desirable: Human somatic cell therapy and gene therapy, cell and molecular biology and immunology, virology, cytokines and growth factors. Experience in the pharmaceutical industry along with computer applications would be desirable. In addition, candidates should have highly developed analytical, written and oral skills, as well as the ability to research problems and issues and to use mature judgment in problem solving.

Candidates for Civil Service or Commissioned Corps appointments must be U.S. citizens. Candidates for Staff Fellowships may be either U.S. citizens or resident aliens eligible for citizenship within four years.

Location: Offices and laboratories are strategically located on the campus of the National Institutes of Health in Bethesda, Maryland, or in close proximity to the campus.

Salary: Civil Service salary range for GS-11 through GS-15 is $32,423 to $83,502. Fellowship salary range is $32,423 to $60,070. Salary, benefits, research support, and level of responsibility are commensurate with education and experience. Some positions may include a Physicians' Comparability Allowance. Positions may also be filled by appointment in the U.S. Public Health Service, commissioned Corps, with commensurate salary and benefits.

How To Apply: Interested candidates should send an Application for Federal Employment (SF-171) and/or current detailed Curriculum Vitae along with bibliography, statement of regulatory/research interest, names of three references, and date of availability to:

FDA/Center for Biologics Evaluation and Research
Attention: Biotechnology Scientist Recruitment - B
Building 29, Room 104, HFB-32
8800 Rockville Pike
Bethesda, Maryland 20892

To receive consideration under this announcement, applications must be received by **Friday, June 19, 1992.**

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Genentech's 2,200 employees work at a scenic site on the San Francisco Bay within short driving distance of Stanford University, and the Universities of California at Berkeley and San Francisco. A new $80 million, 250,000 square foot Research Center will house the entire research function of nearly 300 individuals in the fall of 1992. In addition, Genentech's manufacturing facilities are the best in the industry.

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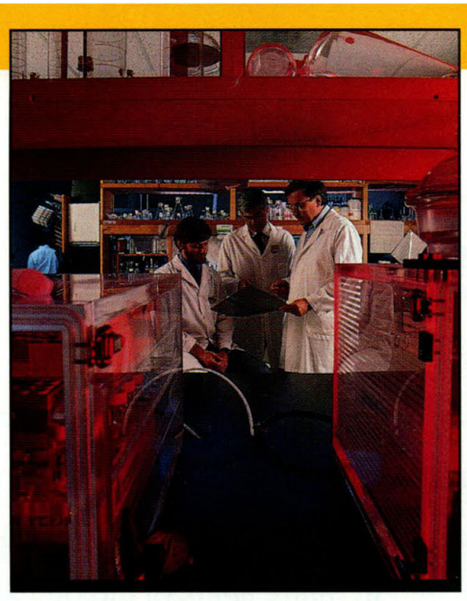

Photo courtesy of Ortho Biotech

ground for our future scientists, and it will continue to be the base for us to extend knowledge of how things work." And Schwartz of Scripps says that the old academic prejudice against industry is becoming "harder to maintain" in light of the truly valuable work industry has produced.

Government, industry, and academia don one another's hats as they cooperate and compete. All three have done so since at least World War II. Oxford University, the American and English governments, and American industry worked together to get penicillin mass-produced and shipped to the battlefield. Government, academe, and industry cooperated in the speedy development and delivery of polio vaccine, which helped end the nightmare of summer for millions of families.

One thing industry knows well: it needs academia. Pfizer brings scientists from Brown University on-site to teach graduate-level courses in the rapidly changing field of immunology. Merck sponsors an "Ambassadors" program in which prominent researchers at MIT, Harvard, Penn State, Princeton, Rutgers, and other top institutions help identify departmental colleagues whose work may have market potential. Many companies sponsor seminar series in which academic researchers present their work to their industrial brothers and sisters. What's more, in light of the changing role of federal money in funding basic research, industry as a whole has begun to bring basic research into the corporate park. Leaders in this movement include Bristol-Myers Squibb, Pfizer, SmithKline Beecham, and Merck. They and other companies are looking not only for the scientist committed to production but also for the scientist dedicated to benchwork.

With dual career tracks in management and research, industry has much to offer scientists who like to be managers.

When industrial scientists find questions they are interested in but can't pursue, they try to get academic researchers involved; when academic researchers make a discovery that might have market potential, they often notify industry. When directors at Amgen learned of research at the Memorial Sloan-Kettering Cancer Center on granulocyte colony-stimulating factor, they began a collaborative project that culminated in the gene being cloned, which led to the aforementioned Neupogen®—and a $50-million payment to Sloan-Kettering, one of the largest amounts ever paid by private industry to a research institution. As Edgar Haber of Harvard School of Public Health puts it, "An unprecedented amount of collaboration is going on—and I know this will continue."

CAREER STORIES

THOSE THAT HAVE BEEN THERE AND BACK

Industrial scientists are the best experts on industrial scientists. The five below have five different stories bound by several themes. Rutter of Chiron and Perlman of Genentech discuss industrial science as the next necessary step beyond basic research. Marzetta of Pfizer and Chilton of CIBA-Geigy discuss the joys of teamwork. Haber looks at the worldwide collaboration between Tower and Corporate Park. All acknowledge the new versatility required of the scientist and the opportunities awaiting anyone with the foresight and the talent required to do good work.

MARY-DELL CHILTON
Vice President of
Agricultural Biotechnology
CIBA-Geigy Seeds

CAROL MARZETTA
Senior Research Scientist
Central Research Division
Pfizer Inc

ANDY PERLMAN
Senior Director of
Clinical Research
Genentech

WILLIAM RUTTER
Chairman of Chiron
Professor Emeritus of Biology
University of California
San Francisco

EDGAR HABER
Elkan R. Blount Professor
of Biological Sciences
Harvard School of
Public Health

FROM ACADEME TO INDUSTRY

"If it works, let's get it out there and get on with it."

MARY-DELL CHILTON
Vice President of
Agricultural Biotechnology
CIBA-Geigy Seeds

Mary-Dell Chilton was graduated from the University of Illinois in 1967 with a PhD in chemistry. There followed a postdoc at the University of Washington in Seattle, where she did DNA hybridization research. She took a research faculty position in the microbiology department and began to study an organism named *Agrobacterium* and how it caused cancer in plants. Her voice is still full of excitement as she relates how "that organism really gave us the idea for gene insertion." Even then, she says, she had an inkling of the implications of DNA technology: "I began to see how this could be useful in applications down the line."

In 1979, Chilton became an associate professor at Washington University in St. Louis. For four years there, she worked closely with scientists at Monsanto in plant gene engineering. In return, Monsanto supported postdoctoral fellowships that allowed Chilton to explore new ways of inserting genetic material into bacterial and plant cells. "At the time, it was technically right at the edge of the doable," she says. The first wave of research in genetic engineering was cresting. "It's astounding how quickly it all moved. As I look back now, those four years seem like ten, just because so much happened."

Chilton had not considered moving wholesale into

genzyme

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Career Stories ***continued***

industry. She was content with her position at Washington University and her relationship with Monsanto. But then some CIBA-Geigy representatives came to call. "They were talking to people, trying to understand the state of science at the time. After two hours of circuitous discussion, they mentioned they were setting up a new research center in North Carolina. Would I be interested in becoming director? The more I thought about it, the better it sounded. The tools, the people, and the resources were there. Academic challenges weren't nearly as exciting."

She made the move and watched a whole division grow up. "Now, I don't say this should be true for everyone, but for many," she says, "industry is a better road. It's hard to get funding in the public sector now. Superstars are getting funding, but those who are young and without visibility are likely to face trouble. The sense is there's less of a pie, and more people—doing more good work—vying for a piece of it. It's a chaotic roulette game for many."

Chilton believes that academic and industrial research require different sets of talents. "In industry, you need to have people skills, the ability to solve problems in a decent, human way. Team play is a big plus. Lip service is paid to teamwork in academia, but in reality, promotional criteria still rest on individual work."

Her career as a scientist gradually revealed to her where her real interests lay. "I realized I didn't have the 'purist' mentality. My satisfaction is with the real-world success of my projects: making plants resistant to diseases and bugs. If we've demonstrated success with a certain way of doing that—even if we don't understand how something works 100 percent—if it works, let's get it out there and get on with it."

Chilton insists on adding a final note: "Want to know what I think about my job? I love it."

STRAIGHT TO INDUSTRY

"It got exciting early for me and stayed that way."

CAROL MARZETTA
Senior Research Scientist
Central Research Division, Pfizer Inc

Carol Marzetta began as just another future scientist. She says that when she arrived for graduate work at Bowman Gray School of Medicine, all she knew was that she was interested in science. "For every question you answer, ten more pop up. It's always fun, and you never get bored. I became involved, passionately, in the research program at Bowman Gray." She gravitated to the joint PhD program in pathology and biochemistry, finding a niche in atherogenesis research.

Bowman Gray taught her science-as-passion. "I saw dedicated academicians who had opportunities to do research in an exciting field with a great potential to help mankind. Once I discovered lipoproteins and the way they were important in humans, I became very excited." After her PhD, she did a four-year postdoc at the University of Washington, where she studied lipoprotein metabolism. "I was making a con-scientious effort to go for human diseases, even though animal models are great. I wanted to figure out what applications my basic science research had in human systems."

As her postdoc wound down, Marzetta was looking at academe for a job. "I wasn't going to interview in industry. After all, I'd already been offered three academic positions. Along the way, a scientist I knew said, 'Come interview at Squibb.' So I did, and Sandoz found out and invited me, and then Pfizer."

What tipped the scale for Marzetta? "Two things—the freedom to do research in my field, and better funds. The NIH situation is so tight right now that your chances are limited—and not only as you first start out. In many fields it gets harder as you go along. I saw that the opportunities for basic research in my field were actually better in industry. That shocked me, quite frankly."

She chose Pfizer. In two short years, she has seen her research grow into possibilities for commercial applications. That is, she cautions, an unusually brief time for most researchers; in her case, this good luck came as a coincidence between her research interests and market needs. "It got exciting early for me and stayed that way," she says. "Sure, I've found some interesting questions that I couldn't pursue myself, but I get outside investigators interested, and so I can be a part of it vicariously. That's what collaborative studies are for."

Marzetta often meditates on the old myth of a split between industry and academia. "When you think about it, all of us have the same goals in mind. It's not as if we should be in opposite camps. But it's interesting to watch the rapidity of the changes, even in the past two years. As industry has made a stronger commitment to catching up in basic research, several top researchers in my field have gone into industry."

Marzetta thinks that PhD candidates should be market-minded, whether they go into academics or into industry: "To get ahead in either area, you have to know what people are interested in now. That's true whether it's pharmaceuticals or academia."

"But really," she says, "if you like doing science, research is exciting enough that you can't go wrong in either setting."

BASIC RESEARCH AND BEDSIDE MEDICINE

"Good ideas rarely die."

ANDY PERLMAN
Senior Director of
Clinical Research
Genentech

Andy Perlman was graduated from New York University with an MD and a PhD in physiology in 1975. Under the supervision of Eric Kandel, Perlman's doctoral work had focused on neurophysiology, with *Aplysia californica* his chosen animal system. He then went to Stanford for an internship and residency in internal medicine, thence back to NYU for a postdoc in molecular endocrinology with Herbert Samuels, and from there to London for a fellowship at the Medical Research Council. While there, he became friends with Barry Sherman, then at the University of Iowa. After the MRC, he joined the Stanford faculty of medicine in the endocrinology division.

In his three and a half years at Stanford, Perlman was a busy and contented researcher. "Things were going well in academics for me," he said. "I'd had good luck with NIH and Heart Association grants, and my research was going well." The satisfactions of academic research included self-direction and the chance to make a difference: "My goal was to do basic research that would have some direct connection to bedside medicine. I had always assumed that the university was geared to individual contributions while companies were geared to taking advantage of all the 'shortcuts.' I was doing what most of us love: independent investigative research."

So how did such a happy academic find his way into the high-powered halls of Genentech? Perlman's story is that of

Make A Difference In The Quality of Life

The Hyland Division of Baxter Healthcare Corporation, a leader in the area of human plasma-derived protein therapeutics, is undertaking the development of its next generation of therapeutics with the aid of state-of-the-art biotechnology. We seek energetic individuals who can contribute effectively in a multi-disciplinary R&D environment in our Duarte, CA facility:

SCIENTIST III
Protein Characterization (Dept. LD/C-3)

We seek an individual with demonstrated expertise in the biochemical characterization of proteins to participate in the study of structure and function of protein therapeutics under development.

In addition to thorough familiarity with protein biochemistry, the selected candidate will also be experienced in electrophoresis, IEF, immunochemistry, protein chemistry, chromatography and spectroscopy. Computer literacy, proficiency with instrumentation setup / troubleshooting / maintenance, and the ability to interpret experiments and prepare technical reports are also necessary. Additional experience in the study of protein-ligand interactions, protein structure-function or posttranslational modifications will be an asset. The candidate should possess a BS/MS in biochemistry / chemistry, laboratory experience beyond university training, excellent communication skills, and the ability to interact in a team-oriented R&D environment.

SCIENTIST IV
Stability (Dept. LD/S-4)

We seek an individual to develop stability protocols, interact with project technical coordinators, regulatory agencies, clinical personnel, and conduct stability evaluations and degradation mechanism studies.

This position requires a PhD/MS in Biochemistry; a solid background in Immunology (5+ years), Biochemistry, Physical Biochemistry, Math Analysis, Statistics and Computer Graphics; and well-developed interpersonal skills. Foreign language skills (e.g. French or German) would be a plus.

The name Baxter Healthcare Corporation is synonymous with products, systems and services devoted to improving health care throughout the world. We are a Fortune 100 company providing a smoke-free work environment, competitive compensation and benefits. Please send your resume in confidence (indicating on the outer envelope the Department Code of this position) to: **Baxter – Hyland Division, Human Resources Dept., 1710 Flower Ave., Duarte, CA 91010.** An Affirmative Action / Equal Opportunity Employer. Employment is contingent upon the result of a drug screening test.

Hyland Division

Baxter

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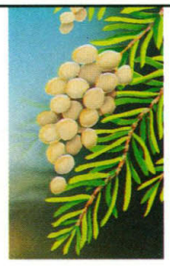

JAPANESE CEDAR affects 8-10 million people in Japan.

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PRECLINICAL RESEARCH

SCIENTISTS

Manager You will manage a group of scientists and associates/assistants involved in the biological profiling of new medicines to treat allergic diseases. Responsibilities of the group include in vivo and in vitro efficacy studies, general pharmacological profiling, and early pharmacokinetic studies. Major involvement in the ex vivo studies is required as part of the clinical efficacy program. Requires a Ph.D. in Immunology/Biochemistry; 6+ years post-doctoral experience, with at least 4+ years in a Biotech/Pharmaceutical R&D organization. Experience with the progression of candidates into early development, and a strong background in pharmacology are required. **Dept. PR/SM.**

Immunology Strong organizational skills are essential to develop and manage this expanding group. You'll conduct T cell and mediator release studies with human patient materials and act as liaison with clinical/development, research and preclinical groups. A Ph.D. in Immunology or a related field, and 2+ years experience in T cell culture methodologies required. Human cellular experience preferred. **Dept. PR/SI.**

Protein Purification You'll provide purified expressed allergen-derived proteins and peptides and facilitate scale-up, pre- and post-IND studies with defined candidates. Requires a Ph.D. in Biochemistry/Biology/Molecular Biology, and 2+ years post-doctoral experience in protein purification. Experience in the purification of recombinantly produced proteins is preferred. **Dept. PR/SPP.**

Biology Supervising at least one RA, you'll perform in vivo and in vitro studies, including efficacy/activity studies, general pharmacology and immunocompetency studies, and collaborate with our chemist group to support pharmacokinetic studies. Requires a Ph.D. in Immunology or a related discipline, and 2+ years experience in animal modeling and work with murine T cells. **Dept. PR/SB.**

ASSOCIATES/ASSISTANTS

Protein Purification You'll assist in the purification and characterization of native and recombinant proteins. A B.S. or M.S. in Biochemistry, with a minimum of 2-4 years protein purification experience required. Knowledge of molecular biology a plus. **Dept. PR/RA.**

Immunology You'll perform tissue culture studies with T cells from human patient clinical trials, organize related data input and analysis and liaison activities. Requires a B.S. or M.S. in Biology/Molecular Biology/Immunology, 2+ years experience in tissue culture techniques, (preferably T cell culture methodologies) and 4+ years lab experience. Strong organizational skills necessary. **Dept. PR/RA.**

We're in a position to offer you exceptional opportunities and support for your professional stature, as well as an excellent compensation and benefits package. Please send your resume, referencing the department, to: *Beth Block, Human Resources Manager, ImmuLogic Pharmaceutical Corporation, One Kendall Square, Building 600, Cambridge, MA 02139.* An Equal Opportunity Employer.

IMMULOGIC
Pharmaceutical Corporation

Career Stories ***continued***

many academicians who migrate to industry. Colleagues and friends who have "gone industrial" invite the good scientists they know to join them. Barry Sherman, whom Perlman met while at the MRC, had started working at Genentech and was also volunteering time at the endocrinology clinic at Stanford. Shared interests led to discussions about what Perlman wanted to achieve and how he wanted to achieve it. Sherman's point was that the "connection" between basic research and bedside medicine was a primary concern at Genentech.

Perlman took a leave of absence from Stanford to try the industrial life, and he liked what he saw. "I enjoyed the level of group activity I found there, the quality of the science, especially what group endeavor can bring to the practice of science. The notion is that everybody stands to benefit from success."

At Genentech, Perlman's research has focused on therapeutic applications of naturally occurring and synthetic protein hormones. His research takes him into both new uses for known hormones and new uses for new ones. His day-to-day work balances intense specialization and interaction with other disciplines. "There's still a fair degree of specialization in my daily work. As a result of being at a company, I've certainly learned a great deal. I often consult with molecular biologists, protein chemists, and chemical engineers."

Perlman appreciates the greater reliability of funding in the industrial sector. "When you're trying to do something as costly as getting a new therapeutic tested, the private sector is infinitely better." Further, he finds the review process by which funds are allocated to be faster and more responsive than the analogous processes in the public sector. "In academic science, you have a system of external peer review. In industry, the peer review comes internally. You have to sell your ideas to get the resources. The nice thing is that the peer review cycle is shorter. And if you're turned down once, you can reapply quickly. In fact, good ideas rarely die. If you have one, and you can convince people it's a good idea, you always have a chance."

As for the state of the life sciences today, Perlman sees a renaissance within a renaissance. "We'll soon see a second wave of importance for molecular biology. In the early days, we could clone genes, and that was sufficient to lead to great changes. Now people will use those tools more effectively and in a more directed manner so that new generations of both protein and nonprotein pharmaceuticals can be produced."

Perlman has kept up ties with academe, serving on the voluntary clinical faculty at Stanford. "There's an enormous amount of collaboration today, and it's enormously important to us. There is unprecedented movement back and forth between industry and academe. Good people have little problem in going either way if they choose. It's not the one-way street it might once have been."

STEP BY STEP

"The route to success involved a huge gamble."

William Rutter
Chairman of Chiron
Professor Emeritus of Biology
University of California
San Francisco

William Rutter received a PhD in biochemistry at the University of Illinois at Urbana-Champaign. He did postdoctoral work at the University of Wisconsin and the Nobel Institute in Stockholm, Sweden. After revisiting Urbana-Champaign, he went to the University of Washington in Seattle, doing pioneering work in biochemistry and genetics. From 1969 to 1982, he chaired the department of chemistry and biophysics at UCSF, and in 1981, he co-founded Chiron, one of biotech's most respected companies.

Rutter views his own path from academic to industrial excellence as largely accidental: "It just so happened that the course of my research led me in directions relevant to commercial endeavors. Step by step, I began to see on several levels that commercial applications were inevitable.

"I was trying to develop human biology from a molecular point of view, particularly genetics, explicitly applying molecular genetics to human systems as opposed to bacterial systems. As the Hormone Research Institute at UCSF grew, it became clear that recombinant genetics and DNA technology would be the inevitable outcome."

Rutter's first contacts with industry were made at Urbana-Champaign, where Roger Adams suggested that Rutter become a consultant for Abbott Laboratories. "Even at that early point, I enjoyed identifying practical problems and their solutions. I enjoyed vigorous work in the intellectual arena coupled to a direct impact on society."

The path that led to Chiron was indeed built step by step. "An early interest was hormones and the mechanism of hormone action. This became more focused on genes—specifically, the insulin gene, which of course had some economic interest and led to a commercial relationship. After a vigorous political chal-lenge to our using recombinant technology, I became all the more committed to use it for human benefit. We began a program in vaccines, which led to a recombinant vaccine for hepatitis B."

There followed further projects in preventative medicine, as well as in utilization of bioregulatory molecules, growth factors, and quasihormones that regulated function. "At every point, I found myself drawn into a competitive arena. To see progress, we had to develop a program outside the university to obtain the necessary resources."

And that is Rutter's main point: industrial production is the logical end of successful research. For him, Chiron is simply a natural extension of work he began 25 years ago. "When we came to consider vaccines for other forms of hepatitis, we were faced with a large number of knowns and unknowns. To investigate this issue, we needed a team and a period of time probably impossible to mount in a university environment, since the route to success involved a huge gamble—which, in fact, was played out over a period of years, without obvious results, until the discovery of the virus itself. Typical granting mechanisms do not allow this approach."

Industrial science offers funding, resources, and collaborative opportunities simply not available in most academic settings. Consider the sheer cost of developing a product, a fact that still staggers Rutter after a decade of experience. "I continue to be amazed at how much it costs to develop a product whose structure and production are known, much less one that needs to be researched into being. One must employ facilities and costly analyses that are simply not possible to address in an academic laboratory. Further, to be truly penetrating, the analysis of a prospective pharmaceutical product requires a range of sciences not usually present in a single laboratory."

Out of sheer commitment and pleasure, Rutter continues to work evenings and weekends at his lab at UCSF, pursuing projects that have nothing to do with Chiron. His life and career attest to a new relationship between industry and academe. "The equilibrium between the university and industry is better than ever before. People move from one to the other and back again. This interplay can't but be good for all concerned."

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We seek a doctoral-level Biostatistician with 2–4 years of experience in clinical trials to participate in: planning strategies for the clinical development of new compounds; designing Phases I–III clinical protocols; providing quality assurance of the final study database; and performing statistical analysis and reporting of collected data. This individual will also work closely with clinical and regulatory departments to prepare final study reports for submission to the FDA. Experience in regression models, survival analysis, and analysis of categorical data is required, along with good communication and interpersonal skills for interaction with data managers, programmers, CRAs and physicians, and the regulatory group. Background with SAS, and solid programming skills are also necessary. Application of these skills within a pharmaceutical environment preferred.

CELLULAR IMMUNOLOGY
Staff Scientists

The Division of Cellular Immunology at Genetics Institute is expanding to examine antigen specific T lymphocyte responses *in vivo*. Current research is directed toward utilizing lymphokines along with defined antigens to generate specific T cell responses against viral pathogens and malignant diseases. Candidates are sought with an interest in defining the *in vivo* activities of novel cytokines. In addition to a PhD/MD, we require several years of post-doctoral research experience in immunology, molecular biology and cell biology, and a good publication record.

HEMATOPOIESIS RESEARCH
Sr. Associate Scientist

Activities will focus on the construction of cDNA libraries; expression plasmids, probes, etc.; expression cloning of novel cytokines; genomic and cDNA library screening; and general molecular biology techniques. BS/MS in Biology, Molecular or Cell Biology, or Biochemistry is required as is proficiency with molecular biology techniques within a multi-project environment. A minimum of 4 years utilizing general molecular biology is desirable.

Please forward your resume, specifying position of interest, to: Human Resources Department, Genetics Institute, Inc., 87 CambridgePark Drive, Cambridge, MA 02140.

GENETICS INSTITUTE

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As an innovative and creative leader in the development of recombinant DNA-based human therapeutics based on the principles of cellular and molecular biology, Amgen is turning research into important clinical solutions. Because of the success of such breakthrough products as EPOGEN® (recombinant human Erythropoietin) and NEUPOGEN® (recombinant human G-CSF), we are expanding our research and further strengthening our technical base.

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Murine Embryonic Stem Cells

PHARMACEUTICS

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EXPERIMENTAL PATHOLOGY/TISSUE REPAIR

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PARALLEL PROCESS, UNPARALLELED PROGRESS.

At Vertex Pharmaceuticals Incorporated, it's how we work together that sets us apart. We unite the disciplines of biology, chemistry and biophysics in a collaborative approach to accelerate the discovery and development of novel therapeutics targeting immunosuppression, antiviral therapy and inflammation. In this parallel process, we've created a unique environment where you'll work directly with some of the top research and development scientists in the industry.

VERTEX

Cell Biologist

We are seeking a BS or MS level candidate with a degree in a related field to assist the Cell Biology/Biochemistry group in identifying and understanding the function of immunosuppressive and anti-inflammatory compounds. The successful candidate will have 2-3 years experience with protein chemistry and purification along with proven skills in immunochemistry, including Western blotting, cell culture and immunoprecipitations. Familiarity with molecular biology techniques including cell transfection is highly desirable.

Enzymologists

You will design and implement enzyme kinetic and binding assays to characterize novel inhibitors of enzyme targets in the areas of immunosuppressants, anti-inflammatory agents or anti-viral therapy. You will also perform experiments to determine the mechanism of action of one or more of these enzymes. We seek a BS or MS in Chemistry or Biology and 2+ years full-time research experience in enzyme kinetics and/or receptor-binding techniques. Experience with protein purification or molecular biology is a plus. The exceptional candidate with a PhD degree and 3+ years' postdoctoral research experience may take principal responsibility for enzymology in one of our new project areas, including site-directed mutagenesis studies of protein structure-function.

Medicinal Chemists

At Vertex, our chemistry leaders are all active experimentalists. As one of those leaders, you will work closely with biologists, biophysicists and computational chemists in an intense and challenging interdisciplinary environment where your proven synthetic organic chemistry skills and medicinal chemical experience can be used and appreciated. The successful candidate must have 2+ years experience in medicinal chemistry, preferably within the pharmaceutical industry, and must currently be spending a majority of time at the bench. We are seeking those with a BS, MS or PhD degree in synthetic organic chemistry who have a compelling and continued record of independent medicinal chemical research. An eagerness and ability to apply insights from biology, structural biophysics and computational chemistry to the process of drug design is essential.

Molecular Biologist

You will work with our molecular biology group in the cloning and expression of new target proteins for drug design. We seek a BS and MS in Biology or Chemistry and 2+ years full-time research experience in molecular biology, with an emphasis on cloning techniques and bacterial expression methods. Experience in using site-directed mutagenesis for protein structure-function studies would be a plus.

Protein Biochemists

Join a research team dedicated to the purification and biochemical characterization of 10-1000 mg amounts of novel proteins, especially soluble enzymes, identified as therapeutic drug targets or novel biocatalysts. Experience with modern chromatographic and electrophoretic methods for protein purification and analysis are essential. Familiarity with using kinetic enzyme assays for quantitative analysis and knowledge of bacterial and yeast fermentation methods are a plus. Experience with protein crystallization is highly desirable. We seek a degree in Biochemistry or related field and 1+ year full-time experience purifying proteins, preferably from natural sources.

Scientific Programmer

We are seeking a BS or MS candidate to assist our biophysics group in developing new computational methods to aid the drug discovery process. The successful candidate should have 3-5 years experience, preferably in a major pharmaceutical firm, with an understanding of protein X-ray and NMR methods. Excellent programming skills in FORTRAN and/or C, familiarity with SGI and IBM/6000 hardware (including graphics) and strong UNIX skills are a must.

X-ray Crystallographers

We are seeking MS and PhD-level candidates to join our X-ray crystallographers in the development of small-molecule human therapeutics, based on the knowledge of the structure of the target proteins of interest. The successful candidate will be involved in all aspects of structure determination from crystallization and data collection to map interpretation and refinement. Brand-new, state-of-the-art facilities are available in our laboratory, including Rigaku rotating anode generators with two Siemens/Nicolet area detectors and a new Rigaku R-Axis II image plate detector, Silicon Graphics 4D/480 and Personal Iris graphics workstations, and other associated equipment. A background in organic chemistry, enzymology, protein biochemistry or other related fields is desirable.

Senior Scientist—Enzyme Product Dev.

Cross-Linked Enzyme Crystals (CLECs™), discovered at Vertex, are a novel form for enzymes which have properties that make them superior to conventional enzymes in industrial processes, as laboratory reagents, as therapeutic agents and in biosensors. Advantages of CLECs include their high density and their stability without the need for an inert support. CLECs retain their activity in harsh conditions including high temperatures, extremes in pH and in the presence of proteolytic enzymes. They are stable when used in organic and mixed aqueous-organic solvents. Vertex is seeking a senior product development scientist to spearhead CLECs development by managing all phases of product development, scale-up activities and assembling and motivating research teams to interact closely with ongoing discovery efforts. This individual will play a key role in business development activities such as presenting technical information to potential and existing customers as well as interacting closely with their technical personnel. We seek a hands-on laboratory professional with proven practical experience scaling up enzyme manufacturing processes from the bench level to economically viable, commercial scale. A PhD in Biochemistry or related Engineering field with 5+ years industrial experience are required.

With our resourceful approach to structure-based rational drug design and a strong financial base, we invite you to take advantage of our excellent salaries, benefits and professional development potential. Please forward a detailed resume to: Vertex Pharmaceuticals Incorporated, c/o SC58 Recruiting Coordinator, 40 Allston Street, Cambridge, MA 02139-4211. We are an Equal Opportunity, Affirmative Action Employer.

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FROM ACADEME TO INDUSTRY AND BACK

"Look for work that broadens the horizons."

EDGAR HABER
Elkan R. Blount Professor
of Biological Sciences
Harvard School of Public Health

Edgar Haber's accomplishments are legion: world-renowned immunologist; pioneer in biotechnology; chief of cardiology at Massachusetts General Hospital for 24 years; Higgins Professor of Medicine at Harvard Medical School. Haber made news when, in 1988, he accepted an invitation from Squibb Corporation to become president of the Squibb Institute for Medical Research. When Squibb Corporation merged with Bristol-Myers Company, Haber was asked to become president of the Bristol-Myers Squibb Pharmaceutical Research Institute and a member of the BMS board of directors. He did so, leaving his professorship and overseeing the coalescence of two massive research facilities into one.

Only a year later, the *Wall Street Journal* and other business periodicals reported that Haber was stepping down, citing "18-hour days" that "left him no time for his own research, which he had expected to do." Haber had helped preside over the creation of Bristol-Myers Squibb, one of the world's largest pharmaceutical companies. He had also created one of the foremost on-site basic research facilities at a pharmaceutical company, beginning what has become an industry-wide trend toward incorporating basic research. Haber, now back at Harvard, is a person who can look at life from both sides now."

Bristol-Myers Squibb and I parted on very happy terms," Haber says. He is still consults for his enormous godchild, maintaining his mature relationship with industry. "I've had a long-standing interest in the industrial interactions with the universities. I had ties with many companies for a great many years as consultant and adviser. My lab at Massachusetts General was funded about 25% by nonoverlapping grants from anywhere up to 10 companies, including Centocor, Shering-Plough, and Upjohn. I never felt any compunction about these ties because, one, I was assured that I had total freedom of research, and two, I kept the projects they funded absolutely separate, to maintain intellectual property rights and clarity of funding."

Haber acknowledges that the academic researcher can be in a tricky relationship with industry. "The prejudice one hears of [against industry] could be well founded—if the scientist is essentially a captive of the industry he's working with. On the other hand, if he is a truly independent investigator with an interest that happens to coincide with those of industry, fine—as long as his university work is not dictated by an industry and he is free to publish and allow his ideas to diverge."

It was because of his interest in spanning the gap that Haber accepted the Squibb challenge. "I was tempted because they said, 'We want you to develop a bridge between the university and industry. Come build a major science project at Squibb with strong and tangible bridges with university colleagues throughout the world.'

"At that time, the pharmaceuticals were not supporting basic research to a great degree. This seemed like a great opportunity to start, when it appeared that the federal government is pulling back in terms of funding. I thought we might form a model for doing new research, to the point that we could benefit our colleagues in the universities."

Haber is perhaps the ultimate example of a committed scientist who also enjoys being a manager. Just as he had built up one of the world's foremost cardiology labs, Haber built up a new research institute at Squibb, including a department of structural biology (specializing in crystallography) and a department of molecular biology (now turning out first-rate basic research in oncogenes). Further, he forged "strong and tangible" networks between academic laboratories and corporate research centers. He is especially proud of major successes such as the large new capital projects at Oxford University; the Université Louis Pasteur in Strasbourg, France; and Mt. Sinai Hospital at the University of Toronto, Ontario, Canada. If the relationship between industrial and academic research is changing, Haber is one of the masters of the change.

But after all that, he left to return to research. "As long as we were moving in a new direction," he says, "I was having a lot of fun. But once the merger came, I became director of R&D and began to see myself as a full-time administrator. More and more, I found I wanted to get back to science."

For Haber there is no yawning divide, only a collaborative opportunity that needs careful tending. He stresses the early stages of a scientist's training. "For the PhD candidate thinking about careers," he says, "it's very important to ensure that there is maximum freedom to pursue research directions early on. That's especially the case in your postdoctoral work. Whether it's in a university or in industry, try to look for work that broadens the horizons rather than narrowing them down to an assigned topic.

"Later, you can make your decision, whether to continue pursuing questions of basic science at the university or take them to a very directed applied lab. Very good science is being done in both places."

Mozart's Conclusion

Scientists tend to gravitate to a single sector of employment and stay there. According to National Science Foundation figures, 91% of scientists working in industry in 1975, and 84% of academics, were still in their respective sectors of employment in 1985. One may speculate forever on exactly what such figures mean. Perhaps scientists get used to a certain environment and tend to stay there; perhaps making a switch takes too much energy and courage. "Looking back," says a former academic turned industrial scientist, "I'm struck by how hard it was to make the switch."

Two more perhapses are that scientists go where their hearts tell them to go and that the heart, if well informed and well heeded, often makes the right choice. Chilton, Marzetta, and several other scientists appear to believe this very thing. One of them, looking for a way to describe why he had chosen industry, told us a story illustrating this principle. "A little boy approached Mozart and asked him, 'How do you write a symphony?' Mozart responded, 'Well, if I were you, I wouldn't try writing a symphony—why don't you try writing a *song* instead?' The little boy persisted: 'But *you'd* written a symphony by the time you were my age.' 'Yes,' said Mozart, 'but I never had to ask anybody *how*.' " ■

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There are a number of components to success in the pharmaceutical research process. The most important is our people. At Schering-Plough, we hire the best talent in our industry. Then, we provide them with the technical resources they need to do their best work: the most advanced instrumentation; the latest computerized systems; modern lab facilities. Finally, we spend over $400 million annually on R&D, and are completing a $300 million R&D facility.

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Senior Scientist

Become a part of our multi-disciplinary team where our current focus of research is on Cytokine Biology and the discovery of lymphokine antagonists. Applicant should have a Ph.D. with 0-4 years' postdoctoral or industrial experience. Research in cell Biology is required; background in Cellular Immunology is highly preferred. Experience in Molecular Biology is a plus. Respond to Dept. 92-13.

Associate Scientist

In this group, you will investigate cytokine and receptor biology and biochemistry. The position requires either a B.S. with 2-4 years' experience or a M.S. with 0-2 years' experience in the areas of Cell Biology and Biochemistry or Immunology. To qualify, you will need specific experience in Biochemistry, tissue cultures, ELISA and bioassays. Experience working in-vivo and/or molecular biology is desirable. Respond to Dept. 92-15.

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Expansion of our in-vivo testing group has created opportunities for innovative scientists to join us for designing and implementing novel in-vivo models for testing target-specific anti-tumor agents. Using state-of-the-art equipments and technologies, our scientists have beén employing conventional and novel models such as human xenograft and scid and transgenic mice for anti-tumor drug evaluation.To qualify for the Senior Scientist position you will need a Ph.D. with 1-4 years' postdoctoral experience in cancer research and hands-on experience with small mammals. Expertise in the area of immunocytochemistry, immunology and molecular biology will be beneficial. For the Assistant Scientist position, the candidate should possess a B.S. degree with 2-4 years' experience or M.S. with 0-2 years' experience in tissue culture and animal handling. Respond to Dept. 91-89.

CARDIOVASCULAR RESEARCH

Associate Scientists

We are seeking 2 Associate Scientists with either a B.S. and 2-4 years' experience or a M.S. and 0-2 years' experience in molecular biology techniques, nucleic acid manipulation, plasmid construction and isolation, DNA mediated transfer techniques in both eukaryotic and prokaryotic cells, DNA sequencing, PCR and RT/PCR to work in our Cardiovascular Research Group. Experience with tissue culture is necessary and ELISA, RIA, immunological techniques highly desirable. Respond to Dept 92-99.

Post-Doctoral Scientist

This is a 2-year postdoctoral position studying aspects of cellular cholesterol metabolism. You'll utilize your knowledge of subcellular tissue fractionation, and characterization of enzymes and proteins involved with cholesterol processing and lipoprotein biosynthesis. Relevant experience in biochemistry, physiology or pharmacology will be considered. Respond to Dept. 92-01.

Associate Scientist

To become a part of the Atherosclerosis Research group the ideal candidate will possess a B.S. with 2-4 years' or M.S. with 0-2 years' experience. You'll need experience in lipid-protein interactions and characterization of membrane proteins, receptors, or enzymes. Knowledge of aspects of cholesterol metabolism is also desirable.
Respond to Dept. 92-16.

All positions offer highly competitive salaries, superior benefits, and all the challenge and growth potential an international industry leader can offer. Applicants should submit their cv, indicating position of interest to: George Czuba, Human Resources Dept., Schering-Plough Research Institute, 60 Orange Street, Bloomfield, NJ 07003. We are an equal opportunity employer.

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☛ **How to Submit a Classified Ad:** Prepare double-spaced typewritten copy. Do not include any abbreviations. *Science* will edit and typeset ads according to *Science* guidelines. Deadline for applications stated in ad must be at least 2 weeks after date of publication. Include billing information, and desired publication date. Available categories: Positions Open, Meetings, Announcements, Courses and Training.

☛ **Mail or FAX materials to:**
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1333 H Street, N.W., Room 814
Washington, DC 20005
Telephone: 202-326-6555
FAX: 202-682-0816

☛ **Rates:** Ads are $42 per line; $420 minimum. One line equals 52 characters and spaces; centered headings equal 32 characters and spaces. A 3% cash discount is granted to all prepaid ads. If you would like *Science* to give estimated cost, indicate on letter.

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Daniel Moran, Traffic Manager
Telephone: 202-326-6541

Janis Crowley, Recruitment Advertising Manager
Telephone: 212-496-7704
FAX: 202-682-0816

CONDITIONS: Personnel advertising is accepted only with the understanding that the advertisers do not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap or sexual preference. The AAAS encourages employers to actively recruit and employ underrepresented minority groups. *Science* reserves the right, at its discretion, to decline to publish advertisements submitted to it.

POSITIONS OPEN

TRUDEAU INSTITUTE, INC.
BASIC RESEARCH SCIENTISTS
INFECTIOUS DISEASES IMMUNOLOGIST

A vacancy exists at the **ASSISTANT PROFESSOR LEVEL** for an immunologist interested in employing modern immunological techniques to analyze immunity to infections with microbial pathogens. The successful applicant will be supplied the resources to develop his/her independent research program within the overall infectious disease program of the Trudeau Institute. Persons interested in developing models of immunity to intracellular pathogens are encouraged to apply. The Trudeau Institute is a not-for-profit, basic research institute. Salaries and benefits are competitive, and working conditions are conducive to a productive research career. Applications consisting of curriculum vitae, the names and addresses of three references, and a brief description of research interests should be addressed to:

Dr. Robert J. North, Director
Trudeau Institute, Inc.
P.O. Box 59
Saranac Lake, NY 12983

ASSISTANT PROFESSOR
MOLECULAR VIROLOGY AND BIOCHEMISTRY
UNIVERSITY OF WISCONSIN–MADISON

The Institute of Molecular Virology and Department of Biochemistry invite applications for a joint, tenure-track position at the rank of assistant professor. Candidates should demonstrate interests and expertise in molecular virology. Within this broad area, emphasis will be placed on selecting an outstanding individual with research interests relevant to the mission of the Department of Biochemistry. Responsibilities will include teaching in the Biochemistry Department curriculum, participating in one or more campus multidisciplinary degree programs such as virology or cell and molecular biology, supervising graduate students, and developing an independent research program. Salary will be on a 12-month basis and will be commensurate with the candidate's experience.

Applicants should submit (1) curriculum vitae, (2) statement of research interests, and (3) three letters of reference by 1 September 1992 to: **Dr. Paul Ahlquist, Search Committee Chair, Institute for Molecular Virology, University of Wisconsin, Madison, WI 53706; telephone: 608-262-4540.**

The University of Wisconsin is an Equal Opportunity/Affirmative Action Employer. Minority and women candidates and all other qualified persons are encouraged to apply. Under Wisconsin statutes, names, titles, and addresses of applicants and nominees may be subject to public release upon request.

MOLECULAR/CELL BIOLOGIST. Immediate opening for tenure-track **ASSISTANT PROFESSOR** in Department of Neurology, Columbia University. Minimum requirements are Ph.D. in molecular biology and 3 years of postdoctoral research experience which has included protein chemistry, tissue culture, and genetic manipulation of cells and organelles. Candidates must be capable of obtaining independent research support. Preference given to individual with experience in mitochondrial genetics. Send curriculum vitae and names of three references to: **Dr. Timothy A. Pedley, Department of Neurology, 710 West 168th Street, New York, NY 10032.** *Columbia University is an Equal Opportunity/Affirmative Action Employer.*

ENVIRONMENTAL MICROBIOLOGIST—ASSISTANT PROFESSOR. The Biology/Microbiology Department invites applicants for a 9-month tenure-track teaching and research position. Ph.D. in microbiology or related area with emphasis in environmental microbiology and experience in anaerobic microbiology are required. Demonstrated teaching ability, research productivity, and skills in communicating and working effectively with students and peers are also required. Send letter of application with curriculum vitae, statements of teaching philosophy and research interests, documentation of expertise in grant writing and extramural funding, and three letters of reference by 15 July 1992 to: **Dr. Gary Peterson, Chair, Search Committee, Box 2207B, South Dakota State University, Brookings, SD 57007. Telephone: 605-688-6141.** *Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

CELL BIOLOGIST—EMBRYOLOGIST

The Gamete and Embryo Research Laboratory of the Department of Ob/Gyn, Cornell University Medical College, seeks applicants with Ph.D. or M.D., Ph.D. preferably with several years of postdoctorate experience in fertilization studies and/or preimplantation development. A wide variety of experience ranging from microscopic to molecular applications is preferred. Application and selection process starts immediately. To be appointed at the **INSTRUCTOR** or **ASSISTANT PROFESSOR** level, depending on experience. Inquiries and applications should be sent to: **Jacques Cohen, Ph.D., Scientific Director of Assisted Reproduction, Associate Professor in Embryology of Obstetrics and Gynecology, The Gamete and Embryo Research Laboratory, Cornell University Medical College, P.O. Box 30, 1300 York Avenue, New York, NY 10021.** *Affirmative Action/Equal Opportunity Employer.*

SURGICAL PATHOLOGIST needed for expanding Department of Pathology at Roger Williams Medical Center. Candidate must be Board-certified in anatomic pathology. Candidate must also qualify for appointment as an **ASSISTANT PROFESSOR OF PATHOLOGY** at Brown University. Proven excellence in patient care and teaching at the medical undergraduate and graduate level is required. The candidate should be skilled in techniques of cell biology with a prior publication record. It is expected that the candidate will establish an independent research program. Send application letter and curriculum vitae to: **Abby L. Maizel, M.D., Ph.D., Pathologist-in-Chief, Roger Williams Medical Center, 825 Chalkstone Avenue, Providence, RI 02908.** *The Roger Williams Medical Center is an Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSISTANT PROFESSOR position available in the Division of Cardiothoracic Surgery. Duties include coordinating some of the group research efforts of the faculty of the division in addition to developing an independent extramurally funded research program in an area related to cardiothoracic surgery. Ph.D. in biomedical engineering or related area with an emphasis on cardiac electrophysiology. Send curriculum vitae to: **Jack J. Curtis, M.D., Division of Cardiothoracic Surgery, University of Missouri–Columbia, One Hospital Drive, Columbia, MO 65212.** Application deadline: 1 June 1992. *The University of Missouri–Columbia is an Equal Opportunity and Affirmative Action Institution; females and minorities are encouraged to apply.*

Two positions at the rank of **POSTDOCTORAL FELLOW RESEARCH ASSOCIATE** or **ASSISTANT PROFESSOR** are available immediately to (1) investigate protein and lipid transport pathways and organelle biogenesis in malaria-infected erythrocytes, and (2) contribute toward development of a blood-stage malaria vaccine. Experience in lipid or protein biochemistry, membrane biology, organelle biogenesis or intracellular trafficking is desirable for the first position. Experience in fluorescence imaging microscopy and image analysis a plus. The second position involves production and testing of monoclonal antibodies for growth inhibition, identification of target antigens, cloning the genes for relevant target antigens and preparation of recombinant proteins. Rank and salary are competitive and commensurate with experience. Send curriculum vitae, a statement of research interests and the names and addresses of three references to: **Theodore F. Taraschi, Ph.D., Thomas Jefferson University, Department of Pathology and Cell Biology, 1020 Locust Street, Philadelphia, PA 19107. FAX: 215-923-2218.** *Equal Opportunity Employer committed to a smoke-free work environment.*

EXPERIENCED MOLECULAR BIOLOGIST

Applications are invited for a tenure-track position at the **ASSOCIATE PROFESSOR** or **PROFESSORIAL** level to direct an ongoing developmental and reproductive biology laboratory. Applicants are expected to have a strong background in molecular biology, be currently funded, and be willing to supervise the training of postdoctoral M.D. fellows. Send curriculum vitae and letters of recommendation to: **Donald M. Sherline, M.D.; Chairman, Department of Obstetrics and Gynecology; Medical College of Georgia; Augusta, GA 30912.** *The Medical College of Georgia is an Equal Opportunity Employer/Affirmative Action Institution.*

POSTDOCTORAL OPPORTUNITIES
Cardiovascular

Lilly Research Laboratories, a division of Eli Lilly and Company, is offering postdoctoral opportunities in our Cardiovascular division. Postdoctoral scientists work in close collaboration with Lilly Scientists from a multitude of disciplines involved in the basic research process of drug discovery. Lilly Research Laboratories offers state-of-the-art research facilities where you will have the opportunity to enhance your skills and continue your learning.

We now have opportunities available within the following areas:

VASCULAR BIOLOGY

Expand your skills as part of a program characterizing molecular and cellular events of restenosis/atheogenesis in human and animal models utilizing hybridoma technology and other approaches. Experience with monoclonal technology is desired. Experience with growth factors and the extracellular matrix would be helpful.

THROMBOSIS PHARMACOLOGY

Direct your talents to research assessing the efficacy and pharmacology of engineered anti-thrombotic proteins, and the role of domain and post-translational modifications in pharmacokinetics and pharmacodynamics. Requires thrombosis experience with a strong background in small animal pharmacology. Experience in biochemistry and/or molecular biology would be helpful.

MOLECULAR BIOLOGY/ BIOCHEMISTRY

Focus your energies on a research project which utilizes molecular, cellular and biochemical approaches to study the regulation of serum lipoprotein modulating genes (such as the LDL receptor and Apolipoprotein AI) by members of the intracellular receptor super gene family.

ADHESION BIOLOGY

Get involved in independent and collaborative research focusing on the role of cellular adhesion molecules in inflammation. Specifically, you'll study neutrophil adhesion molecules and the transduction signal via these molecules. Study involves both *in vitro* and *in vivo* work.

ELECTROPHYSIOLOGY

Apply yourself to independent and collaborative research on the action of drugs and electrical fields on cardiac ion channels. Team members will include electrophysiologists, biomedical engineers and pharmacologists. Knowledge of whole cell and/or patch techniques required. Familiarity with computer-based data acquisition and analytical techniques desirable.

MOLECULAR BIOLOGY/GENETICS

Become involved in a multi-disciplinary study of the molecular and cellular biology of genes and gene products involved in controlling coagulation and inflammatory responses. Emphasis will be on factors involved in the protein C regulatory pathway. Areas of study will include endothelial/smooth muscle cell regulation, approaches to gene therapy, and protein engineering.

Lilly

Postdoctoral appointments are for one year and are renewable for a second year upon mutual agreement. Eli Lilly and Company provides a comprehensive salary and benefits program including relocation expenses. Qualified applicants should send their curriculum vitae, including area of interest, to: Albert L. Peyton, PhD, PhD Recruitment, Dept. S-0508, Eli Lilly and Company, Lilly Corporate Center, Indianapolis, IN 46285. Equal Opportunity Employer.

BIOTECHNOLOGY

Ideas in Action!

Perkin-Elmer, extending their range and depth of product offerings and software enhancements, serves demanding global markets with thermal coatings and analytical instrumentation used in biotechnology research, environmental protection, pharmaceutical monitoring and surface analysis. In a dynamic environment that encourages people to translate their ideas into measurable objectives, you can make a unique contribution as:

SENIOR TECHNICAL SPECIALIST

Research & Development

Fully conversant with analytical instrumentation, you will directly contribute to the development and evaluation of instrumentation for DNA amplification and the analysis of PCR products. You will participate in multi-disciplinary development teams ensuring careful evaluation, documentation and publication of results in scientific journals. This position requires an MS degree in molecular biology or biochemistry (Ph.D. preferred) with 3 to 5 years of recent academic or industrial lab experience utilizing techniques for DNA separation, amplification and detection.

TECHNICAL SPECIALIST

PCR Customer Support

In a role that requires up to 75% travel, you will assume primary responsibility for presenting technical PCR seminars and techniques workshops to customers and sales professionals, and providing direct telephone applications support to molecular biologists performing PCR-related techniques. Also, you will develop technical documentation, product support literature and articles for publication. This challenge should be approached with at least a BS degree in molecular biology or biochemistry (MS preferred) with 1 to 3 years of recent lab experience utilizing techniques for DNA isolation, manipulation, separation, amplification and optical detection.

Perkin-Elmer rewards qualified professionals with outstanding growth opportunities, competitive salaries and a comprehensive benefits program. Interested candidates are requested to forward a resume and salary requirements in confidence to: **Mr. J. T. Kulas, Manager, Human Resources, The Perkin-Elmer Corporation, 761 Main Avenue, Norwalk, CT 06859-0325.**

We are an equal opportunity employer M/F/D/V

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PERKIN ELMER

Research opportunities in an ideal setting.

Anergen is an exciting and growing biotechnology firm located on the shores of the San Francisco Bay, a short drive from Stanford, UCSF and UC Berkeley. We are developing novel therapeutics for the treatment of human autoimmune diseases including multiple sclerosis, myasthenia gravis, and rheumatoid arthritis.

The following positions are currently available.

RESEARCH SCIENTISTS

Molecular Biologist — Requires a PhD in Molecular or Cellular Biology and 1-2+ years' experience cloning T cell receptor genes and MHC class II molecules in baculovirus or other host vector systems.

Cellular Immunologist — Requires a PhD in Immunology and 1-3+ years' experience in human immunology, including T cell cloning. Knowledge of flow cytometry and lymphokine biology beneficial.

RESEARCH ASSOCIATE

Molecular Biologist — Requires a BS/MS in a related scientific discipline and 1-2+ years' experience in recombinant DNA. A background in heterologous gene expression in baculovirus systems is also required.

Anergen offers an attractive compensation and benefits package. For immediate consideration, please forward your resume indicating area of interest to: Anergen, Inc., Attn: Joan Shields, 301 Penobscot Drive, Redwood City, CA 94063; or fax it to: (415) 361-8958. EOE.

Anergen, Inc.

National Institute of Mental Health
Division of Basic Brain and Behavioral Sciences

Second NIMH Conference on Molecular Neurobiology

September 20-23, 1992
Keystone, Colorado

This conference will provide a forum for a multidisciplinary discussion of recent advances in molecular neurobiology with particular emphasis on synaptic function and neural plasticity. A principal aim is to bring molecular biologists, neurobiologists, and psychiatric researchers together in order to discuss ways in which the advances in molecular neuroscience can lead to an enhanced understanding of cognitive processes and the etiology and pathophysiology of the major psychiatric disorders.

Session Topics & Invited Speakers:

Voltage-gated Ion Channels
R.Aldrich, W. Catterall, L. Jan, C. Miller, W. Stuhmer

Secretory Vesicles and Exocytosis
W. Almers, P. DeCamilli, R. Scheller, T. Südhof

Transmitter Receptors and Coupling Mechanisms
S.Heinemann, S. Nakanishi, P. Seeburg, N. Unwin

Synaptic Plasticity
E. Kandel, R. Llinas, T. Sejnowski, R. Tsien

Modulatory Factors
L.Birnbaumer, D. Choi, K. Dunlap, B. Hille, H. Schulman

Control of Gene Expression
J.-P. Changeux, T. Curran, M. Greenberg, M. Motminy

The deadline for submission of applications to attend is July 1, 1992. Scientists interested in attending should submit a one-page letter describing their research interests and its relevence to this meeting as well as a 200-word poster abstract to:

Steven J. Zalcman, M.D.
National Institute of Mental Health
Division of Basic Brain and Behavioral Sciences
Room 11-105
5600 Fishers Lane
Rockville, Maryland 20857

Novo Nordisk

Novo Nordisk Biotech, Inc.

Giving Pure Research Practical Expression.

Novo Nordisk Biotech, Inc. has been established as a wholly owned R & D subsidiary of Novo Nordisk A/S, a major international Danish industrial biotechnology and pharmaceutical company. Novo Nordisk Biotech, Inc., located in Davis, CA, is focusing on the cloning, expression, mutagenesis and characterization of industrial enzymes.

The Company has several positions open within each discipline noted below. If you are an experienced professional who's looking for an excellent career opportunity, then give your pure research talents practical expression at Novo Nordisk Biotech, Inc.

Microbiology:

Research Manager/Staff Scientist (1)

Ph.D. in microbiology/genetics with over seven years research experience. The Research Manager position will be responsible for directing the company's R & D in microbiology, focusing on filamentous fungi, as well as supervising the microbiology group.

Scientists (3)

Ph.D. in microbiology/genetics with one to six years research experience.

The candidates must have experience in microbial methods including, the genotypic and phenotypic characterization of filamentous fungi, yeast or bacteria. Prior experience with novel strain development including, classical mutagenesis, transformation methods, and screening of transformants is essential. An understanding of taxonomy is desirable.

Protein Chemistry/Enzymology:

Research Manager/Staff Scientist (1)

Ph.D. in biochemistry or related discipline with over seven years research experience. The Research Manager position will be responsible for directing the company's R & D in protein chemistry/enzymology, as well as supervising the protein chemistry group.

Scientists (3)

Ph.D. in biochemistry or similar discipline with one to six years research experience.

The candidates must have a strong knowledge of protein chemistry and/or enzymology. Prior experience with protein purification, characterization and/or enzyme kinetics is essential. Work in this group will also cover protein sequencing and engineering.

B. thuringiensis Molecular Biology

Scientists (2)

Ph.D. in molecular biology or related discipline with one to six years research experience working with *Bacillus thuringiensis*. The candidate must have facility with cloning and expression of recombinant proteins in *Bacillus* systems, site-directed mutagenesis and DNA sequencing.

These positions require a proven record of innovative research involving their respective disciplines, as demonstrated by publications in peer reviewed journals. We are seeking individuals who are innovative, well organized and highly motivated who would like the opportunity to join a start-up company supported by the strength and vision of a major international leader in biotechnology. Novo Nordisk Biotech, Inc. offers competitive compensation and a comprehensive benefits program.

If you are interested in a challenging position and meet the above criteria, please send your curriculum vitae with a list of references for consideration, in confidence, to: **Novo Nordisk Biotech, Inc., Department of Human Resources, 1445 Drew Avenue, Davis, CA 95616. Please indicate the position for which you are applying.** We are an equal opportunity employer.

Novo Nordisk A/S is a major international biotechnology company leading in the manufacture of insulin and the treatment of Diabetes. The company is the world's largest producer of industrial enzymes and also manufactures a number of other pharmaceutical and bioindustrial products such as antibiotics and biopesticides. The company employs more than 9,000 people in 30 countries and has its headquarters in Denmark.

POSITIONS OPEN

FACULTY POSITION IN PHYSIOLOGY UNIVERSITY OF ROCHESTER

Applications are invited for a tenure-track position at the **ASSISTANT/ASSOCIATE PROFESSOR** level within the Department of Physiology. We are seeking individuals who are interested in physiological problems which require the use of modern molecular and cellular approaches. The current strengths of the department are in ionic channels in nerve and muscle cells, molecular studies of intracellular signaling and regulatory systems, and integrative neurophysiology. The successful candidate should complement one of these areas. Faculty are expected to establish an independent research program and to participate in graduate and medical education. Review of applications will begin on 1 July 1992. Applicants should submit curriculum vitae, statement of research interests, and names of three or four references to: **Dr. Paul Horowicz, Chair, Department of Physiology, Box 642, University of Rochester Medical Center, Rochester, NY 14642–8642.** *The University of Rochester is an Affirmative Action/Equal Opportunity Employer.*

The Department of Biological Chemistry is seeking applications at the **ASSISTANT** or **ASSOCIATE PROFESSOR** level for a 12-month, tenure-track faculty position(s). Outstanding individuals with research experience or interests which augment current departmental programs in the areas of gene regulation, signal transduction mechanisms, or structural biochemistry are sought. Individuals working with yeast or higher eukaryotic systems are encouraged to apply. The successful candidate will be expected to establish an active, externally funded research program. Other responsibilities will include teaching biochemistry to undergraduate, graduate, medical, or dental students, participating in the department graduate program, and other activities. Applicants should send curriculum vitae and bibliography, a brief description of current and future research directions, and request three letters of reference to be sent to: **Dr. Jack E. Dixon, Chair, Department of Biological Chemistry, University of Michigan Medical School, 5416 Medical Science I, Ann Arbor, MI 48109–0606.** Deadline for applications is 1 August 1992.

The University of Michigan is an Affirmative Action/Equal Opportunity Employer. Applications from qualified women, minorities, and/or disabled individuals are encouraged.

A position at the rank of **POSTDOCTORAL FELLOW** or **RESEARCH ASSISTANT PROFESSOR** is available to investigate the action of alcohols and anesthetics on cell membranes. Investigations are well supported by an NIH-funded Alcohol Research Center Program and involve preparation of biological and model membranes, HPLC, GC, binding assays and animal behavioral studies. Applicant is expected to apply ESR, NMR, or fluorescence techniques to investigate membrane-anesthetic interactions. Rank and salary are competitive and commensurate with experience. Send curriculum vitae, a statement of research interests and the names and addresses of three references to: **Nathan Janes, Ph.D., Thomas Jefferson University, Department of Pathology & Cell Biology, 1020 Locust Street, Philadelphia, PA 19107. FAX: 215-923-2218.** *Equal Opportunity Employer committed to a smoke-free work environment.*

DEPARTMENT OF PHARMACOLOGY, THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE. Applications are invited for an **ASSOCIATE/FULL PROFESSOR** tenure-track faculty position. Expertise in one of the following areas is preferred: molecular toxicology, neuropharmacology or cardiovascular pharmacology. Outstanding individuals with active funded research programs and teaching experience suitable for a department of pharmacology are being sought. The successful candidate is expected to continue to expand his/her research program and to be involved with the teaching and training of medical and graduate students. Applicants, M.D. and/or Ph.D., should send curriculum vitae, statement of research and teaching interests and experience, and the names of three references by 30 June 1992 to: **Dr. John J. Enyeart, Chair, Search Committee, Department of Pharmacology, The Ohio State University College of Medicine, 5198 Graves Hall, 333 West Tenth Avenue, Columbus, OH 43210–1239.** *The Ohio State University is an Affirmative Action/Equal Opportunity Employer. Qualified women, minorities, Vietnam-era Veterans, disabled veterans and the disabled are encouraged to apply.*

INSTRUCTOR/ASSISTANT PROFESSOR

The Department of Neurology at the University of Texas Southwestern Medical Center is seeking a Ph.D. scientist to conduct studies in mechanisms of DNA damage and repair in central nervous system tumors. This is a faculty position at the Instructor/Assistant Professor level with appropriate background and training required. Send curriculum vitae, cover letter, and references to: **Dr. S. Clifford Schold, Jr., Chair, Department of Neurology, The University of Texas Southwestern, 5323 Harry Hines Boulevard, Dallas, TX 75235–9036. Telephone: 214-688-3703.** *The University of Texas Southwestern Medical Center is an Equal Opportunity/Affirmative Action Employer.*

FACULTY POSITIONS IN PHYSIOLOGY

The Department of Physiology at Loyola University Chicago, Stritch School of Medicine, is seeking applicants for several tenure-track positions at the **ASSISTANT, ASSOCIATE OR FULL PROFESSOR LEVEL.** Applicants must have a Ph.D., M.D. or equivalent and are expected to have the ability to establish a strong research program. Senior applicants should have a strong record of research productivity. Applications are especially encouraged from individuals with research using molecular, cellular or biophysical approaches in the study of ion channels/membrane transport or signal transduction and E-C coupling in smooth, cardiac or skeletal muscle. Send letter, curriculum vitae including research plans and names of three references to: **Donald M. Bers, Ph.D., Chairman, Department of Physiology, Loyola University Chicago, 2160 First Avenue, Maywood, IL 60153.** *Loyola is an Equal Opportunity/Affirmative Action Employer.*

The Swiss Federal Institute of Technology Zurich (ETH Zurich) invites applications for a position of

PROFESSOR OF BEHAVIOURAL BIOLOGY AND FUNCTIONAL TOXICOLOGY

The teaching responsibilities of the new professor include graduate-level training in the fields of behavioural biology and toxicology as well as contributions to basic courses within the biology and environmental sciences curricula. In research the emphasis is on system-oriented research on acute and chronic influences on behaviour and the central nervous system as well as their effects in the vegetative correlates. Cooperation with other research groups within and outside the university is encouraged.

Candidates with substantial achievements in research and teaching experience should submit their applications with curriculum vitae and a list of publications no later than 15 July 1992 to: **The President of ETH Zurich, Professor Dr. J. Nüesch, ETH-Zentrum, CH-8092 Zurich.** *In its effort to increase the number of women in academic top positions, the ETHZ specifically invites applications from women.*

UNIVERSITY OF WASHINGTON VISITING PROFESSOR IN MARINE BOTANY

Marine botanist sought for research/teaching position. Teach seminar/specialty course in Seattle spring 1993 and marine botany course at Friday Harbor Labs summer 1993. Send curriculum vitae by 1 September 1992 to: **J. R. Waaland, Department of Botany, University of Washington, Seattle, WA 98195. Telephone: 206-543-7098 or 543-1942; FAX: 206-685-1728.** *The University of Washington is an Equal Opportunity/Affirmative Action Employer.*

SWISS INSTITUTE OF ALLERGY AND ASTHMA RESEARCH

The Swiss Institute of Allergy and Asthma Research (SIAF) in Davos seeks **HEAD OF CLINICAL RESEARCH.** The clinical research at the SIAF seeks to define pathogenic mechanisms of asthmatic and atopic diseases. The head of clinical research will implement, coordinate and direct both laboratory and clinical research of the institute in collaboration with the different chest and dermatology clinics in Davos. The applicants should have an M.D. degree and be familiar with a range of modern techniques to clinical asthma research, supported with an adequate record of publications. Applications in writing (including detailed curriculum vitae) should be sent to: **P.D. Dr. K. Blaser, Swiss Institute of Allergy and Asthma Research, Obere Strasse 22, CH-7270 Davos, Switzerland.**

The Medical University of South Carolina College of Medicine invites applications and nominations for the position of **PROFESSOR AND CHAIR** of the Department of Medicine. Applicants must be Board-certified in internal medicine, have administrative experience and strong leadership skills, have an outstanding record of accomplishment in research, desire for academic excellence, and have interest in all aspects of teaching and patient care. Clinical facilities include a recently renovated 550-bed university hospital, a 280-bed Veteran's Administration Medical Center and a 142-bed Charleston Memorial Hospital, a county-supported institution operated by the Medical University. The department consists of 100 full-time faculty and 12 divisions. The graduate medical education program includes 59 interns and residents, and 42 fellows. The overall departmental budget exceeds $20 million annually. Interested persons can send curriculum vitae by 1 August 1992 to: **Fred A. Crawford, Jr., M.D., Professor and Chairman, Department of Surgery, Chairman, Medicine Search Committee, c/o Dean's Office, College of Medicine, Medical University of South Carolina, 171 Ashley Avenue, Charleston, SC 29425.** *Equal Opportunity/Affirmative Action Employer.*

ASSISTANT DEAN (CHAIR) of the Basic Sciences Division. Responsible for administration of the departments of anatomy, biochemistry, immunology, microbiology, pathology, pharmacology and physiology, and development of curricula coordinated with clinical sciences. Ph.D. in a biomedical science required; experience in administration, teaching, curriculum development; and history of funded research in basic and/or clinical studies. Opportunities for clinical research. The New York College of Podiatric Medicine (NYCPM) is a 4-year postgraduate institution with 450 doctoral students in podiatry. Send curriculum vitae by 1 June 1992 to: **Jean Berkoff, Director of Human Resources, NYCPM, 53 East 124th Street, New York, NY 10035.**

DIRECTOR CENTER FOR ALCOHOL STUDIES

The School of Medicine of the University of North Carolina at Chapel Hill seeks a director for the Hargrove "Skipper" Bowles Center for Alcohol Studies, an interdisciplinary center established for the purpose of conducting, coordinating and promoting basic and clinical research on the causes, prevention and treatment of alcohol abuse. The center will occupy the Hargrove "Skipper" Bowles Building, a part of the new $29-million state-of-the-art research complex, which is scheduled to be completed in late 1993. The director is the Chief Administrative Officer of the center and reports to the Dean of the School of Medicine. Candidates should have the M.D., Ph.D., or equivalent degree, a strong record of research achievement and a commitment to continue an active research program, administrative experience, and qualifications for a primary tenured appointment at the level of associate or full professor in a basic science or clinical department in the School of Medicine. The deadline for receipt of applications is 22 June 1992 and should include current curriculum vitae, names and complete addresses of three references and a letter expressing interest. Please send materials to: **William D. Mattern, M.D., Chair, CAS Search Committee, Office of the Dean, School of Medicine, CB# 7000 Macnider, University of North Carolina, Chapel Hill, NC 27599–7000.** *Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.*

HEALTH RADIATION CONTROL MANAGER

The Minnesota Department of Health is seeking an experienced manager to head its Section of Radiation Control. At a minimum, applicants must possess a Bachelor's degree in physics, public health, chemical engineering, or a closely related degree and 2 years of professional experience with primary responsibility for developing radiation control measures, conducting health risk or environmental impact assessments from radiation sources or nuclear power generating plants, or planning radioactive waste disposal, transportation and storage; or a Master's degree and 1 year of experience as listed above.

Applicants who meet the minimum qualifications will be further screened on additional factors, such as their supervisory and fiscal management experience. For an application and additional information, please call **612-623-5401**; or write the **Human Resource Management Office, P.O. Box 9441, Minneapolis, MN 55440.** *An Equal Opportunity Employer.*

Molecular Biosystems, Inc. (MBI), a leader in the development and manufacturing of contrast agents for medical imaging, including ultrasound and magnetic resonance imaging, is seeking qualified candidates for the following positions:

- **Director, Research** - Ph.D. in Chemistry, Biochemistry or relevant science with 7-10 years experience in pharmaceutical research.

- **Associate Director, Preclinical** - DVM or Ph.D. specializing in pharmacology, toxicology, or physiology with 5-10 years pharmaceutical development experience in IND/NDA submissions.

- **Scientist** - Ph.D. in Biochemistry with 5 years research experience. One year project management experience desired. (Emphasis in physical, analytical biochem or protein chemistry).

- **Scientist** - Ph.D. in Analytical Chemistry with 5 years analytical method development supporting regulatory filings (IND/NDA).

- **Scientist**- Ph.D. in Pharmacy, 5 years experience with formulating organic and inorganic based drugs for solubility and tissue specific delivery systems.

- **Research Associate II**- BS Biology/Chemistry or Biochemistry with 3 or more years lab experience; or MS with one year lab experience. Qualified candidates will be familiar with techniques in chromatography, electrophoresis and spectrophotometry.

- **Research Associate II** - BS in related field with 3 or more years lab experience; or MS with one year lab experience. Background in Image analysis and Physiology. Fortran C & BASIC computer languages in DOS & Macintosh environments for scientific programming. Experience of compliance to IEEE and FDA software engineering guidelines desired.

- **Research Associate II** - BS Physiology/Biology with 3 or more years lab experience; or MS with 1+ years lab experience. Knowledge of aseptic techniques, computer skills and animal studies. Must not object to animal testing.

- **Research Associate II** - BS Physiology/Biochemistry with 3 or more years lab experience; or MS with 1+ years lab experience. Applicants should be familiar with techniques in wet chemistry, spectrophotometry & chromatography.

We offer competitive salaries, a comprehensive benefits package and a pleasant working environment. Qualified candidates should submit résumé with salary history to: **Molecular Biosystems, Inc., Human Resources Department A37-93, 10030 Barnes Canyon Road, San Diego, CA 92121.**

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An Equal Opportunity Employer

Clinical Tenure Track Position In Neuropharmacology Using Positron Emission Tomography.

A new tenure track position is available beginning in July 1992 or July 1993 in the Laboratory of Neurosciences, S.I. Rapoport, MD, Chief. This position provides an excellent opportunity for neurologists, psychiatrists, clinical pharmacologists or other clinicians who plan a research career in *in vivo* brain imaging and neuropharmacology. Graduates of this program are currently directing imaging and Alzheimer's programs across the country.

Research training focuses on the use of positron emission tomography to measure drug modulation of human brain function, metabolism, and blood flow at rest and during cognitive stimulation in relation to aging and disease (e.g., Alzheimer's disease, geriatric depression, Down syndrome and other retardations). The candidate will be responsible for writing and conducting clinical protocols and will have limited clinical responsibilities on an 8-bed clinical research unit.

MD degree and medical license are required (foreign physicians must be ECFMG certified) and previous experience in clinical pharmacology and pharmacokinetics is required. Starting salary commensurate with training and experience. For further information, contact M. B. Schapiro, MD, Chief, Brain Aging and Dementia Section, Laboratory of Neurosciences.

NATIONAL INSTITUTES OF HEALTH

National Institute On Aging

National Institutes of Health, 9000 Rockville Pike, Building 10, Room 6C-414, Bethesda, MD 20892 • 301-496-4754

Equal Opportunity Employer

KAROLINSKA INSTITUTE

Professorship of Tumor biology

The Department of Tumor biology has been developed by professor Georg Klein into one of the most well-known research units of the Karolinska Institute. The institute now declares a faculty position open to head this research unit. The unit will move into a new building together with the departments of immunology and virology during the autumn of 1993.

Further information concerning this position may be obtained from the Dean, professor Erling Norrby, phone no +46 8-7351200, fax no +46 8-7304407.

Deadline for applications is June 1, 1992.

Application with curriculum vitae, details of the applicant's scientific career, a list of publications and reprints of 20 selected publications and an outline of plans for future research should be sent in 4 copies to:

Registrator
Karolinska Institutet
P.O. Box 60400
S-104 01 STOCKHOLM
Sweden

REGIONAL DIRECTOR

Our client is **PANLABS, INC.**, a growing international company providing research and development services for the pharmaceutical industry for over twenty years.

The Regional Director will establish a marketing and sales presence on the **East Coast** by:

- Maintaining and expanding excellent client relationships and a high level of service.
- Determining opportunities and developing programs to build upon current services.
- Developing, implementing, monitoring, and evaluating a regional marketing plan.
- Reviewing laboratory results and test data, then writing summary reports to clients.

Candidate will be qualified by:

- Ph.D. in Pharmacology or a related field with documented expertise in pharmacotherapeutics.
- Strong drug discovery research in industry.
- Outstanding interpersonal skills with a team approach and an achievement orientation.

The individual will be located on the East Coast and must be prepared to travel 40–50%.

Miller+Miller
P.O. Box 3088, Kirkland, WA 98083
Phone: 206-822-3145 Fax: 206-827-9194

DIRECTOR OF MEDICAL RESEARCH

Marshfield Clinic, a 400-physician multispecialty not-for-profit group practice, is seeking a M.D. or Ph.D. Director for its expanding Medical Research Foundation. Experience in medical research plus management and excellent communication skills are required. The Director is responsible for the planning, development, implementation and evaluation of basic and applied clinical research programs. He or she reports directly to the President of the Marshfield Clinic.

Founded in 1959, the Research Foundation has grown significantly and currently includes five complete Basic Science Research Laboratories, the Department of Epidemiology and Biostatistics, the National Farm Medicine Center, the Rural Health Research Center, ongoing clinical research projects and other areas of study. This outstanding opportunity is located in one of the Midwest's best small cities.

Send curriculum vitae with cover letter to:

William O. Myers, M.D.
Chairman
Search Committee
1000 North Oak Avenue
Marshfield, WI 54449

MARSHFIELD CLINIC

POSTDOCTORAL FELLOWSHIP CNS

Marion Merrell Dow Research Institute

Cincinnati Center

A postdoctoral position is currently available in the CNS Department at the Marion Merrell Dow Research Institute in Cincinnati, Ohio. The candidate will have molecular biology expertise to participate in the cloning and expression of neurotransmitter receptors and ion channels. This position offers a unique opportunity to develop signal transduction and molecular modeling technology in the analysis of receptor structure and function.

Our research-based company is committed to a number of areas in CNS drug research and is actively pursuing novel approaches to the treatment of neurodegenerative disorders. You'll also find an affordable yet cosmopolitan lifestyle in Cincinnati. The fellowship is for one year, with a renewable second year. Please send curriculum vitae and three references to: Marion Merrell Dow Inc., Staffing Dept. KAS, P.O. Box 9627, Kansas City, MO 64134. Equal Opportunity Employer.

MARION MERRELL DOW INC.

New Research and Development Projects of the New Energy and Industrial Technology Development Organization In Japanese Fiscal Year 1992

The New Energy and Industrial Technology Development Organization (NEDO), a semi-governmental organization established to implement the policies of the Ministry of International Trade and Industry of Japan, is pleased to announce its intention to undertake several new research and development projects in Japanese Fiscal Year (JFY) 1992 extending from April 1, 1992 to March 31, 1993. These new projects, which are undertaken as part of Japan's National Research and Development Program and Research and Development Program on Medical and Welfare Equipment Technology, are outlined below.

A. OUTLINE OF EACH PROGRAM AND NEW PROJECTS FOR JFY 1992

(1) The National Research and Development Program

1) Outline of the program

Research and development of large-scale industrial technologies aiming at basic technologies in industrial science, promotion of rational development and use of resources, prevention of industrial pollution, contributions to society and the like.

2) Outline of new projects for JFY 1992

a. Extreme Manipulation of Atoms and Molecules

Research and development of fundamental technology for the observation and manipulation of atoms and/or molecules with extreme precision in three-dimensional space or on solid surfaces, and of basic support technology.

(2) Research and Development Program on Medical and Welfare Equipment Technology

1) Outline of the program

Research and development of technology for new equipment which is needed in the medical field and for taking care of the physically disabled.

2) Outline of new projects for JFY 1992

a. Optical Tomographic Imaging System

Research and development of a diagnostic system which can obtain tomographic images of the oxygen metabolism in living bodies by the CT method using near infrared light.

b. Stereotactic Treatment System for Cancer

The objective of this project is to develop technology for a stereotactic treatment system which can focus a prescribed high dose of X-ray irradiation on a small volume of cancer tissue by X-ray beam irradiation control and other supporting methods.

B. PROCEDURE FOR PARTICIPATION

(1) Official announcements for each of the above projects will be made in the Ministry of International Trade and Industry's "Tsusansho Koho," which is published daily in Tokyo. Copies of the announcement appearing in "Tsusansho Koho" will also be distributed to OECD member country embassies in Japan.

(2) The announcement for the two Research and Development Program on Medical and Welfare Equipment Technology projects was made in the April 30, 1992 issue of "Tsusansho Koho," and an English-language translation of the announcement appears on another page in this issue of Science. The announcement for the National Research and Development Program project will be made around September. When the timing for this project announcement is fixed, NEDO will be able to notify those companies or organizations who inquire regarding such information.

(3) Those companies or organizations who wish to participate in a project are required to attend an explanatory meeting held by NEDO shortly after the project announcement is officially issued. In case a responsible person from a company or organization is unable to attend this meeting, attendance by a substitute who is capable of explaining the contents of the meeting accurately is necessary.

(4) During the explanatory meeting, the contents of the new project and the application documents will be explained. Japanese will be the only language used during the meeting.

(5) The time period for submitting all applications is about two (2) months after the appearance of NEDO's official announcement In "Tsusansho Koho."

(6) After the close of the application period, NEDO will notify all applicants after screening their applications.

C. REMARKS

(1) The cost of project research and development will be borne by NEDO in accordance with its calculation of contract amounts, auditing methods concerning contract costs, and the terms and conditions which NEDO specifies.

(2) The results derived from NEDO-funded research and development projects shall be jointly owned by NEDO and the companies or organizations which conducted the research and development.

D. FURTHER INFORMATION

If you have any questions regarding this announcement, you may contact:

Mr. Kenzo Hanamoto
Director, Contract Division, Accounting Department
New Energy and Industrial Technology Development Organization
Sunshine 60 Building, 28th Floor
1-1 Higashi Ikebukuro, Toshima-ku, Tokyo
Telephone: 03-3987-9319
Telefax: 03-5992-1184

POSITIONS OPEN

UNIVERSITY OF FLORIDA

VICE PRESIDENT FOR RESEARCH AND DEAN OF GRADUATE SCHOOL

Applications and nominations are invited for the dual position of vice president for research and dean of the graduate school at the University of Florida. Successful candidates will have significant experience and demonstrated success in university-based research environments. The doctoral or equivalent degree in an appropriate area of specialization and relevant experience is necessary.

Applications should include a current résumé and names, addresses and telephone numbers of at least three references. Nominations and applications should be submitted not later than 15 September 1992 to: **Dr. Yngve Ohrn, Chair, Vice President Search Committee, Office of the President, 226 Tigert Hall, University of Florida, Gainesville, FL 32611.**

TECHNICAL SERVICES MANAGER

Kemin Industries, Inc., a manufacturer of mold inhibitors, antimicrobial compounds, marigold pigmenters, antioxidants, flavors and surfactants for animal feed, seeks a technical services manager for its North and South America operations. Based in Des Moines, Iowa, the successful candidate will have a Ph.D. in biochemistry or related field and possess excellent oral presentation skills. The technical services manager will provide technical product information and consulting for customers, organize university efficacy trials, provide technical training for salespeople and distributors, and supervise two technical service laboratory personnel. A background in animal agriculture as well as commercial experience is preferred. Frequent overnight travel is typical during the work week. Non-smoking environment. Pre-employment physical with drug screen required. Please submit a résumé, as well as other relevant information, to: **Dr. C. E. Nelson, Kemin Industries, Inc., Box 70, Des Moines, IA 50301.** *Equal Opportunity Employer.*

IMMUNOLOGY/TOXICOLOGY

The School of Marine Science, Virginia Institute of Marine Science, College of William and Mary, invites applications for a tenure-track **FACULTY POSITION** in immunology/toxicology of marine and estuarine organisms. Ph.D. required with demonstrated experience in modern immunological approaches to toxicological research. The successful applicant will have a commitment to graduate education and will be expected to develop a vigorous, extramurally funded research program to investigate the effects of anthropogenic chemicals on the immune system of finfish or shellfish. Depending upon qualifications, the position may also involve some program administrative responsibilities. Rank and salary dependent upon qualifications. Position available 1 July 1992.

Send curriculum vitae, statement of research interests and the names of four references to: **Dr. E. M. Burreson, School of Marine Science, Virginia Institute of Marine Science, Gloucester Point, VA 23062.** Review of applications will begin on 1 June 1992 and will continue until the position is filled. *Women and minorities are especially invited to apply.*

The College of William and Mary is an Affirmative Action, Equal Opportunity Employer.

INSTRUCTOR: Department of Pathology, College of Physicians and Surgeons of Columbia University. Position available in the Immunogenetics Division for a Ph.D. trained in cellular immunology and molecular biology. Candidate must have extensive experience in T cell cloning and functional characterization as well as in recombinant DNA technology. Specific responsibilities of this position will be the day-to-day supervision of the cellular immunology laboratory. Send curriculum vitae and names of three references to:

Dr. Nicole Suciu-Foca
Professor of Pathology,
Director of Immunogenetics
College of Physicians and Surgeons of
Columbia University
630 West 168th Street
New York, NY 10032

Columbia University is an Equal Opportunity/Affirmative Action Employer.

POSITIONS OPEN

MOLECULAR/CELL BIOLOGIST THE BEN MAY INSTITUTE THE UNIVERSITY OF CHICAGO

The Ben May Institute of the University of Chicago is seeking applicants for a junior or intermediate level **FACULTY POSITION**. We are developing a strong program in the molecular aspects of the control of cell growth and differentiation. We are seeking an outstanding individual who is using the approaches of molecular biology or cell physiology to examine basic mechanisms of cell signaling events or regulation of gene expression. Existing related research programs in the Ben May Institute include molecular and genetic aspects of receptor signaling mechanisms involving steroid hormone receptors, growth factor receptors, and T lymphocyte activation and regulation. Candidates should have sufficient research experience to demonstrate both significant accomplishment and outstanding promise. Letters of application including curriculum vitae, bibliography, a brief statement indicating research interest, and the names of three references should be sent to: **Dr. Frank Fitch, Director, Ben May Institute MC6027, THE UNIVERSITY OF CHICAGO, 5841 South Maryland Avenue, Chicago, IL 60637.** *An Affirmative Action/Equal Opportunity Employer.*

LEWIS & CLARK COLLEGE BIOLOGY DEPARTMENT. Applications are invited for two full-time 1-year replacement positions for the 1992–93 year. One to teach courses in the areas of cell biology, microbiology, botany and/or general biology. The second, pending, to teach courses in ecology, evolution, field biology and/or general biology. Ph.D. or A.B.D. required. Send letter, curriculum vitae, and two letters of references to: **Dr. Edwin Florance, Department of Biology, Lewis & Clark College, Portland, OR 97219. Telephone: 503-768-7515.** Review of applications begins 22 May 1992; searches will remain open until positions are filled.

Lewis & Clark College is an Equal Opportunity Employer and encourages the application of women and minority candidates.

JUNIOR FACULTY POSITION MOLECULAR VIROLOGIST

The Department of Virology & Molecular Biology at St. Jude Children's Research Hospital is recruiting a molecular biologist who is interested in genetic variation and the structure and function of influenza virus proteins. Candidates should have a Ph.D., M.D. or veterinary degree with research accomplishments that reflect a strong background in virology and molecular biology. The institution has new research space with strong CORE facilities in molecular biology and computing.

Candidates should send curriculum vitae, including a brief description of their research and names of three references to: **Dr. Robert G. Webster, Department of Virology & Molecular Biology, St. Jude Children's Research Hospital, 332 North Lauderdale, P.O. Box 318, Memphis, TN 38101–0318.**

Equal Opportunity/Affirmative Action Employer.

FACULTY POSITION IN BIOCHEMISTRY. The Dr. William M. Scholl College of Podiatric Medicine (SCPM) invites applications for a full-time faculty position in the Department of Physiology, available 1 July 1992, offering faculty rank and salary commensurate with professional experience and achievements. We require a Ph.D. in biochemistry, or related area, and a firm commitment to teaching. Position involves teaching a comprehensive course in medical biochemistry to medical students. Limited funds are available for research. Possible future appointment of a research director may be combined with this position. Please submit a letter of application, curriculum vitae, and supporting material, including names/addresses of three references to: **Scholl College of Podiatric Medicine, Dr. John H. Becker, Ph.D., Associate Dean, Basic Sciences, 1001 North Dearborn, Chicago, IL 60610.** *SCPM is an Equal Opportunity Employer.*

SANTA MONICA COLLEGE is accepting applications for a tenure-track faculty position for fall 1992: **ANATOMY/PHYSIOLOGY INSTRUCTOR.** Minimum qualifications: Master's degree in a biological science or the equivalent or possession of an appropriate valid California community college credential authorizing service in the specified subject area(s). Salary range: $30,498 to $62,400. Closing date: 18 June 1992. For application information, contact: **310-452-9336.**

POSITIONS OPEN

FACULTY POSITIONS

The Department of Pharmacology and Molecular Biology at The Chicago Medical School is initiating the third phase of faculty recruitment for tenure-track positions at all levels. Only candidates with a funded, independent research program will be considered. Preference will be given to research in molecular toxicology, molecular endocrinology and molecular carcinogenesis. The school is located in a modern facility adjacent to the very pleasant North Shore community of Lake Bluff, 38 miles from downtown Chicago with proximity to forest preserves and Lake Michigan. The department under new leadership has already recruited several faculty of high caliber. Excellent core facilities and strong graduate program (Ph.D. and M.D./Ph.D.) with substantial financial support are available. Salary and other benefits highly competitive. Please send curriculum vitae, research plans and three names for reference to: **Dr. Samson T. Jacob, Chairman, Department of Pharmacology and Molecular Biology, The Chicago Medical School, 3333 Green Bay Road, North Chicago, IL 60064.** *The Chicago Medical School is an Equal Opportunity//Affirmative Action Employer.*

UNIVERSITY OF ALASKA FAIRBANKS

The School of Fisheries and Ocean Sciences has an opening for a **VISITING FACULTY POSITION.** The position is for a 6- to 9-month appointment. Opportunities exist for participating in ongoing research in Alaska or to initiate own research.

The duties include teaching one course in renewable resource management systems using computers as the primary work tool and possibly one statistical course.

Work station is in Juneau, Alaska. Salary commensurate. Position starts 15 August 1992.

Send application and three references to: **JCFOS, 11120 Glacier Highway, Juneau, Alaska 99801.** For additional information contact: **Dr. O. A. Mathisen at 907-789-4442** or **FAX at 907-789-4447.** Applications must be received by 15 June 1992.

The University of Alaska is an Equal Opportunity/Affirmative Action Employer and Educational Institution.

FACULTY/POSTDOCTORAL POSITIONS AVAILABLE IN BIOCHEMISTRY/MOLECULAR BIOLOGY UNIVERSITY OF MICHIGAN

Faculty (non-tenure research track) and postdoctoral fellow positions are available in a multidisciplinary research environment to study the role of retinoic acid in the regulation of extracellular matrix formation in human skin. Studies will focus on the modulation of collagens, elastin, and metalloproteinases by retinoic acid in the repair of aged and UV light-damaged human skin. Faculty position requires 3 to 5 years of relevant postdoctoral experience. Faculty applicants should include a brief (one-page) description of research interests. Both positions offer competitive salaries and excellent opportunities for career development. Send curriculum vitae to: **Dr. John J. Voorhees, Professor and Chairman, University of Michigan, Department of Dermatology, 1301 East Catherine, Kresge I, R6558, Ann Arbor, MI 48109–0528; telephone: 313-747-0078.** *The University of Michigan is a nondiscriminatory/Affirmative Action Employer.*

THE HEBREW UNIVERSITY FACULTY OF DENTAL MEDICINE FACULTY POSITION

The Faculty of Dental Medicine invites applications for a tenure-track position of lecturer/senior lecturer in dental basic sciences, with interest in research in one of the following subjects: (1) oral infections, (2) hard tissues, and (3) salivary glands. Ph.D. or Ph.D./D.M.D. degree and postdoctoral training is required. Excellence in research and teaching is of prime importance. Preference will be given to candidates who have shown independence in research and capability to utilize updated techniques to answer questions of importance related to their research. The successful candidate is expected to participate in teaching of assigned basic dental subjects. Applicants should send curriculum vitae, list of publications, three to five selected reprints, a short summary of research activities, plans of activity in the new position and three letters of recommendation, before 16 January 1993, to: **Professor A. Shteyer, Dean, The Hebrew University–Hadassah Faculty of Dental Medicine, P.O.B. 1172, Jerusalem 91010, Israel.**

Public Announcement Regarding: New Research and Development Projects on An Optical Tomographic Imaging System and a Stereotactic Treatment System for Cancer

Announced by the New Energy and Industrial Technology Development Organization on April 30, 1992

In order to promote the research and development of industrial technologies, the New Energy and Industrial Technology Development Organization (NEDO) would like to inform all interested companies and research organizations regarding the research and development projects described below. These new projects are being undertaken as part of the Research and Development Program on Medical and Welfare Equipment Technology of the Agency of Industrial Science and Technology, Ministry of International Trade and Industry of Japan.

Themes of the Research and Development Projects

1. "R&D of an Optical Tomographic Imaging System"
2. "R&D of a Stereotactic Treatment System for Cancer"

Outline of the Research and Development Work to be Entrusted

1. R&D of an Optical Tomographic Imaging System

The objective of this project is to develop technology for a diagnostic system which can obtain tomographic images of the oxygen metabolism in living bodies by the CT method using near infrared light transmissible through living bodies.

2. R&D of a Stereotactic Treatment System for Cancer

The objective of this project is to develop technology for a stereotactic treatment system for cancer. With such a system, it will be possible to focus a prescribed high dose of X-ray irradiation on a small volume of cancer tissue despite tissue displacement by using X-ray beam irradiation control and other supporting methods. Effective treatment for cancer will thus be more successful.

Procedures for Application

(1) Qualification Criteria

All companies or research organizations who meet the following qualification criteria may submit an application to participate in the above projects:

1. The applicant must have previous research and development experience in the field covered by or related to the project and possess the organizational structure, human resources and research facilities required to carry out the project work.
2. The applicant must be in sound financial condition and have the ability to manage its finances and facilities as necessary to smoothly carry out the project work.
3. The applicant must be able to comply with NEDO's instructions, if such are necessary, to fully carry out the project work.
4. The applicant must have attended the explanatory meeting held by NEDO as set forth in item (2) below or been represented at the meeting by a responsible agent or representative who is capable of accurately conveying the contents of the meeting in detail.

(2) Explanatory meeting

An explanatory meeting will be held on the date shown below in order for NEDO to fully explain the details of each project's research and development work to be entrusted and the application documents to be submitted. All companies or research organizations who are interested in submitting an application to participate in a project are required to attend this meeting or to send an agent or representative to attend on their behalf. Japanese will be the only language used during the meeting.

Date: Thursday, May 21, 1992
Time: 14:00 to 15:00
Place: NEDO's Head Office
30th Floor, Sunshine 60 Building
1-1, Higashi-Ikebukuro 3-Chome
Toshima-ku, Tokyo 170

(3) Further Information

For further information regarding the research and development work to be entrusted under the above projects, please contact NEDO by telefax as follows:

New Energy and Industrial Technology Development Organization
Contract Division, Accounting Department
28th Floor, Sunshine 60 Building
1-1, Higashi-Ikebukuro 8-Chome
Toshima-ku, Tokyo 170 Japan
Telefax: 03-5992-1184

POSTDOCTORAL OPPORTUNITIES

Work With World-Class Scientists

At the Medical Research Division of American Cyanamid Company, we're making important strides in developing a new generation of therapeutics based on molecular biology and cell-specific mechanisms. From research programs that focus on molecular biology and genetics to define specific molecular targets and other molecules involved in critical cellular functions, to our molecular biologists being the first to clone and sequence the ß-amyloid precursor gene from patients with Alzheimer's, and our study of the mechanism by which the peptide is deposited, our scientists are making significant contributions in drug discovery and development. We invite you to consider the following positions for postdoctoral fellows:

CNS Biological Research Department

Your primary responsibilities will include studying structure/activity relationships in potassium channels. The successful candidate will have a PhD and 0-3 years of postdoctoral training with a background in standard techniques of molecular biology. (Dept. PS)

Molecular Cardiology Research Department

Utilizing your experience in lipid and lipoprotein biochemistry or cell membrane structure/function, the PhD scientist we seek will study the mechanisms of cellular cholesterol transport to plasma lipoproteins. A combination of cell biology, lipid biochemistry, genetic and biological techniques will be used. (Dept. FM)

We are located at the Lederle Laboratories Campus of American Cyanamid in Rockland County on a 580-acre campus-like setting only 25 miles north of New York City. Salaries are competitive and include comprehensive benefits. For consideration send c.v. with the names and telephone numbers of three references and indicating the Dept. # for the position of your choice, to: Professional Employment Representative, Medical Research Division, Lederle Laboratories, Pearl River, NY 10965.
An Equal Opportunity Employer M/F.

Lederle

Dedicated People Dedicated To People Since 1906.

RESEARCH ASSISTANT

Regeneron Pharmaceuticals, Inc. is dedicated to developing therapeutic agents for degenerative and traumatic neurological diseases.

The Transgenic Animal Care Facility is seeking a Bachelor's or Master's level candidate with 2-3 years experience in Molecular biology and mouse embryo manipulations to participate in all aspects of gene targeting experiments in embryo-derived stem cells to construct mouse model systems for neurological diseases.

Regeneron is situated in an excellent campus environment near Tarrytown, in Westchester County, 25 miles north of New York City. For immediate consideration send detailed resume with salary history to: Human Resources Bin T, Regeneron Pharmaceuticals, Inc., 777 Old Saw Mill River Road, Tarrytown, N.Y. 10591. Equal Opportunity Employer m/f.

REGENERON
Pharmaceuticals, Inc.

VETERINARY DIRECTOR OF LABORATORY ANIMAL RESOURCES

Roswell Park Cancer Institute, an NCI-designated comprehensive cancer center with over 200 senior research faculty members, is seeking candidates for appointment as Director of Laboratory Animal Resources. As Institute Attending Veterinarian, the incumbent will be responsible for providing veterinary care for the Institute's laboratory animal programs to comply with federal, state and institute standards. This will include management and direction of a vigorous animal health surveillance program, review and development of animal research and surgery protocols, provision of veterinary support and educational services, and overall management of facilities and staff of the Department of Laboratory Animal Resources. The incumbent will play a central role in the design and planning of a new animal facility.

Candidates must 1) hold a D.V.M./V.M.D. degree from an accredited college of veterinary medicine, 2) be federally accredited and 3) be certified or eligible in the American College of Laboratory Animal Medicine. The incumbent will become part of a group of professionals engaged in service and basic research. Preference will be given to candidates who also hold an advanced degree in basic science or who have registered other scientific accomplishments. The successful candidate will be expected to contribute to the academic programs of RPCI.

Send resume/c.v. with a statement of basic research experience, a listing of peer-reviewed publications and references to:

James P. Karr, Ph.D.
Office of Scientific Administration
Roswell Park Cancer Institute
Elm and Carlton Streets
Buffalo, New York 14263.

ROSWELL PARK CANCER INSTITUTE

Roswell Park is an EOE/MFHV

INNOVATIVE PRODUCTS HAVE FUELED OUR GROWTH.

As a result of strong R&D spending—and the development of important new pharmaceutical products—Abbott has achieved 20 years of consecutive growth and close to $7 billion in sales. This continued success has created the following positions within our Pharmaceutical Products Division.

Experience The Abbott Edge.

ANTI-INFECTIVE DRUG DISCOVERY GROUP
Research Microbiologist

The candidate we select will participate in all aspects of *in vivo* characterization of anti-infective compounds, design and develop immunological assays for characterization of animal models, and evaluate immunonutritional and anti-infective compounds. We require a PhD Microbiologist/ Immunologist with 0-3 years post-doctoral experience in cellular immunology and microbiology. Knowledge of pathology, bacteriology, mycology, and virology is desired. **Reply to Job# 50504.**

ANTI-VIRAL DRUG DISCOVERY GROUP
Virologist

Responsibilities include conducting analysis and detailed evaluations of current drug candidates, performing studies on the mechanisms of viral resistance, identifying new anti-viral targets, and derivation of novel screening candidates. We require a PhD in Molecular Virology and 0-4 years related experience, along with demonstrated experience in one or more areas of virology (herpesvirus, rhinovirus, papillomavirus, or retrovirus) with emphasis in Molecular Biology. Experience in anti-viral drug characterization is desired.**Reply to Job# 50512A.**

Research Assistant

We have a technical-level position available for a research assistant with a relevant BS/MS degree and related experience. Candidates must have knowledge of cell culture-based viral assays and molecular biology techniques. May require working with HIV or other viral agents. **Reply to Job# 50512B.**

Abbott provides an excellent salary and benefits package including profit sharing and a stock retirement plan. We are located in an attractive suburban setting approximately 30 miles north of Chicago. For consideration, forward your resume (indicating appropriate Job #) and salary history to: **Patricia Handy, Corporate Placement, Abbott Laboratories, One Abbott Park Rd., Abbott Park, IL 60064.** Abbott is an Affirmative Action Employer/Smoke-Free Environment.

Stop by and see us at the ASM Placement Service

ABBOTT LABORATORIES

Quality Health Care Worldwide

1888-1992

PERFECTING THE SCIENTIFIC ENVIRONMENT.

At Chiron Corporation, we recognize that our success as a biotechnology leader is a direct result of our open, science-based culture which fosters creativity and rewards innovative contributors. By providing scientists with the freedom and the resources to focus on quality research, our young and dynamic company has pioneered a number of scientific breakthroughs: the first genetically engineered vaccine for the hepatitis B virus, and the discovery of the hepatitis C virus, to name but two.

A global organization, we have developed four businesses in: diagnostics, therapeutics, vaccines and ophthalmics. This solid and diversified foundation has created exceptional opportunities for our people to make a difference. We continue to expand our research efforts and seek top scientific talent in a variety of areas.

If you'd like more information on how you can make a difference in human healthcare within our progressive organization, please contact our Human Resources Department, Chiron Corporation, 4560 Horton Street, Emeryville, CA 94608. We are an Equal Opportunity Employer.

CHIRON
CORPORATION

SCIENTISTS & RESEARCH ASSTS.

DNA Analysis Technology

Molecular Tool, Inc. is a biotechnology company located in Baltimore, Maryland that is committed to the development and commercialization of highly integrated DNA-based systems for the analysis of complex genomes and genetic loci. Together with a key industry partner, Molecular Tool has embarked on a significant research and product development program for the near-term implementation of a large-scale DNA analysis system.

Scientists and **Research Assistants** are invited to join a multi-disciplinary team that is shaping the future of DNA analysis technology. Candidates with experience in the following areas are encouraged to apply:

- **Nucleic Acid Enzymology:** Nucleic acid biochemistry with emphasis on enzyme reaction optimization and DNA hybridization.
- **Nucleic Acid Diagnostics:** Product development, technology transfer or reference laboratory management in the area of nucleic acid analysis.

Situated on a campus of the Johns Hopkins University School of Medicine, Molecular Tool, Inc. offers a stimulating scientific environment, competitive salaries, an incentive program and medical insurance benefits. Interested candidates should send a resume together with the names of three references to **Ms. Loretta Burrows, Molecular Tool, Inc., Alpha Center, Hopkins Bayview Research Campus, 5210 Eastern Ave., Baltimore, MD 21224.** An Equal Opportunity Employer.

MOLECULAR TOOL, INC.

GENE TRANSFER

Viagene, Inc.

VIAGENE, INC., a biopharmaceutical company developing a new generation of gene-based therapeutics for the treatment of viral diseases and cancers, is expanding its drug development programs. We currently have multiple opportunities for:

SCIENTISTS

Candidates with Ph.D. or MD/Ph.D. and between 0-5 years experience in Biomedical Research in either an academic or industrial setting with particular emphasis in cell biology, molecular biology, biochemistry and tumor cellular immunology.

In addition, we are seeking individuals who have between 5-10 years post graduate experience with expertise in applied cancer biology (including animal tumor models) and cancer immunology. Industrial experience is preferred.

VIAGENE, INC. offers an exciting and challenging environment in a sunny San Diego setting along with an attractive salary and benefits program. Please submit resume/cv to:

Viagene, Inc.
Human Resources
11075 Roselle Street San Diego, CA 92121
An Equal Opportunity Employer

Postdoctoral Position

DEVELOPMENTAL BIOLOGY DEPARTMENT

Amgen is currently recruiting to fill a postdoctoral position within the Developmental Biology Department. The successful candidate will carry out research aimed at generating transgenic mice useful in the study of cell growth and differentiation. The individual should be a recent graduate with a Ph.D. in the life sciences, and experienced in molecular genetics and the use of mouse embryonic stem cells to generate transgenic mice. The position is supported by a full-time research associate, is funded for two years with the possibility of a third year of support, and has a salary of $35,000, $37,500, and $40,000 for successive years.

An objective of the postdoctoral program is to provide experience for exceptional individuals who are considering a career within the biotechnology industry. Research is conducted in an academic atmosphere in which publication is encouraged. Outstanding individuals within the program are encouraged to apply for staff scientist positions.

Interested candidates should send a curriculum vitae, with publication record and references, along with a letter describing research experience and interests to: **Robert A. Bosselman, Ph.D., Developmental Biology Department, Amgen Inc., Amgen Center, Mailstop 5-1-A-219, Thousand Oaks, CA 91320.** Amgen is an equal opportunity employer.

AMGEN®

Principals only, please.

MOLECULAR BIOLOGIST

5 Prime → 3 Prime, Inc., a leader in the development of unique products for research in molecular biology and genetic engineering, is seeking a Senior Scientist for Research and Development.

The position requires a Ph.D. in Molecular Biology or closely related discipline with a minimum of 2 years postdoctoral training. We are seeking a creative, enthusiastic scientist to join an equally creative group of scientists developing advanced systems for genetics, microbiology, molecular immunology, and protein biochemistry.

5 Prime → 3 Prime, Inc. offers excellent professional growth opportunities and a competitive compensation package. The company, located in Boulder, Colorado, is within minutes of the University of Colorado and the magnificent front range of the Rocky Mountains. Boulder offers a matchless quality of life and unlimited opportunity for academic and cultural stimulation.

Send C.V. and 3 professional references to:

Randolph J. Hellwig, Ph.D.
Director, Research & Development
5 Prime → 3 Prime, Inc.
5603 Arapahoe Avenue
Boulder, CO 80303

REGIONAL MEDICAL ASSOCIATE

SmithKline Beecham is a $9.2 billion global pharmaceutical and health care company. Our world famous products and reputation mean unsurpassed opportunities for individuals to combine their scientific and marketing expertise as a Regional Medical Associate.

Our Regional Medical Associates establish relationships within major medical institutions for the purpose of acting as scientific liaison and providing in-depth information regarding SmithKline Beecham products. This includes the training of representatives and medical professionals. Travel 40%.

To qualify, you must have a Ph.D. in Pharmacology, Toxicology, Microbiology or related life sciences. Strong marketing and communication skills and a high degree of initiative are also required. An opportunity currently exists in the Western Region, which includes Hawaii, Alaska, Oregon, Washington and Idaho.

We offer one of the best compensation packages - including a car - in the industry. If you'd like to be a part of our success, send your resume and salary history to: Dept. WD2097, c/o Box 16, Science Classified Advertising, Rm 814, 1333 H Street NW, Washington, DC 20005. We are an Equal Opportunity Employer, M/F/H/V.

SB
SmithKline Beecham
Pharmaceuticals

ROCHE

An Environment Where
Intellectual Freedom Fosters
Scientific Excellence

SENIOR SCIENTIST
PhD BIOCHEMIST

At Hoffmann-La Roche, remarkable pharmaceutical breakthroughs are the direct result of talented teams of innovative scientific professionals enjoying an extraordinary level of freedom and resources . . . financial, technical and human.

The incumbent will use conventional and state-of-the-art technology to isolate and purify natural as well as recombinant proteins derived from bacteria and yeast. Additional responsibilities include planning and designing experiments in agreement with project priorities.

The qualified professional will have a PhD in Biochemistry and 2-3 years of postdoctoral experience in the areas of enzymology and protein biochemistry. Knowledge of HPLC and FPLC is desirable.

The esteem with which Roche holds this position is reflected in a compensation package designed to attract and retain a candidate of preeminent scientific intellect. Please send resume, salary history and requirements to: **Mrs. Eleanor M. Malone, Staffing Department EM62FK, Hoffmann-La Roche Inc., Nutley, New Jersey 07110-1199.** We are an equal opportunity employer.

ROCHE **Hoffmann-La Roche**

RESEARCH OPPORTUNITIES

Hybritech Incorporated, a subsidiary of Fortune 100 Eli Lilly and Company, is a leader in the development of *in vitro* and *in vivo* products utilizing monoclonal antibody technology. We have immediate and challenging opportunities for key scientific talent in our Research & Development divisions.

RESEARCH SCIENTIST

Responsibilities include developing radiolabeling procedures and analytical assays of radioactive metal-ion chelate complexes. The ideal candidate will have an MS in Chemistry and excellent analytical skills (TLC, HPLC), as well as experience with radioisotopes and micromanipulations (TC-99m).

SYNTHETIC ORGANIC CHEMIST

This position involves the optimization and preparative synthesis of chelating agents for clinical evaluation. It requires an MS/PhD in Organic Chemistry and a broad knowledge of organic reactions, peptide synthesis and analytical techniques (LC, HPLC, IR, UV, NMR). Experience handling radioisotopes and chelating agents is desirable.

POST DOCTORAL FELLOWS

We have four opportunities for Post Doctoral Fellows:

- One position will conduct research on homogeneous electrochemical immunoassays. PhD in Chemistry with expertise in electrochemistry and a working knowledge of amperometric or potentiometric sensors are needed.
- Another position will investigate cell immortalization. PhD in Molecular Biology with knowledge of oncogenes, gene transfer *in vitro*, and cell culture are necessary.
- This position will participate in the development and characterization of murine models of antibody production using transgenic technologies. Requirements include a PhD in Molecular Biology and knowledge of transgene design, PCR and DNA analysis.
- This Post Doctoral candidate will elucidate the pharmacokinetic properties of a novel drug delivery system. A PhD in Chemistry, familiarity with pharmacokinetic behavior of small molecules and experience in quantitative analysis are needed.

Hybritech offers a stimulating work environment and competitive salaries and benefits. Please send your resume to: HYBRITECH INCORPORATED, Human Resources SM/S/5-8-92, P.O. Box 269006, San Diego, CA 92196-9006. We are committed to diversity in our workforce/EOE.

TEAM
Hybritech INCORPORATED

Make A Difference In The Quality of Life

The Hyland Division of Baxter Healthcare Corporation, a leader in the area of human plasma-derived protein therapeutics, is undertaking the development of its next generation of therapeutics with the aid of state-of-the-art biotechnology. We seek a self-motivated, creative and thorough individual to develop/perform experiments relating to new or existing feasibility projects.

SCIENTIST IV
Feasibility

The selected candidate must have a Master's degree (PhD preferred) in chemistry or biochemistry, coupled with 5 years research/development experience in protein purification and characterization. Applicants must be able to work independently, write concisely, interpret data, and draw suitable inferences/conclusions.

The name Baxter Healthcare Corporation is synonymous with products, systems and services devoted to improving health care throughout the world. We are a Fortune 100 company providing a smoke-free work environment, competitive compensation and benefits. Please send your resume along with a cover letter summarizing your qualifications and salary history in confidence to: **Baxter - Hyland Division, Human Resources Dept. LD/F-4, 1710 Flower Ave., Duarte, CA 91010.** An Affirmative Action/ Equal Opportunity Employer. Employment is contingent upon the result of a drug screening test.

Hyland Division

Baxter

TRANSPLANTATION BIOLOGIST

Opportunity for a Ph.D. or M.D. with 3–5 years post-doctoral experience in the immunobiology of transplantation. Those with basic research interests including T-cell immunology, graft-infiltrating cells, T-cell receptors, MHC biology, lymphokines and molecular or cell biology will be considered. The successful candidate will have laboratory space at the Blood Research Institute and will be expected to interact significantly with a large solid organ transplantation program at the Medical College of Wisconsin. Opportunities for development of clinical applications are also available. Interested individuals should submit a statement of research interests, a CV and the names of three references to: David D. Eckels, Ph.D., Senior Investigator and Director, Immunogenetics Research Section, Blood Research Institute. The Blood Center of Southeastern Wisconsin, 1701 W. Wisconsin Avenue, Milwaukee, WI 53233.

Blood Research Institute

The Blood Center
of Southeastern Wisconsin

The Blood Center of Southeastern Wisconsin is an Equal Opportunity Employer.

KAROLINSKA INSTITUTE CENTER FOR BIOTECHNOLOGY

Postdoctoral research assistant (two positions)

The Center for Biotechnology is a competitive, scientifically attractive and well equipped centre within the sphere of molecular biology. Approx. 100 scientists and technical assistants are active within this center. Important research areas include steroid receptors, intracellular sorting of membrane proteins and immunogenetics.

The two positions are within our program for orphan receptors; this type of receptors constitutes an exciting new development in the field of the nuclear receptor supergene family.

The positions as postdoctoral research assistant are initially for two years with possibilities for extension up to four years. Preference is given to applicants with experience in molecular biology and protein purification.

Applications should be sent to Professor Jan-Åke Gustafsson, Center for Biotechnology, NOVUM, S-141 57 HUDDINGE, Sweden, together with CV, relevant publications and names of two references.

POSITIONS OPEN

POSTDOCTORAL—MOLECULAR IMMUNOBIOLOGY. We are offering a 2-year postdoctoral position studying the molecular immunobiology of autoimmune diseases. This project focuses on the molecular basis of self-antigen recognition in the tissue-specific autoimmune disease, myasthenia gravis [*Gene* **98**, 298 (1991); *J. Immunol.* **146**, 2245 (1991); *Int. Immunol.* **3**, 983 (1991)]. We require a Ph.D. in biochemistry, molecular biology, or immunology. Candidates with a strong background in T cell receptor structure and function are especially encouraged to apply. Please send your curriculum vitae to: **Professional Staffing, Department PD-S, APPLIED IMMUNE SCIENCES, 200 Constitution Drive, Menlo Park, CA 94025–1109.** *Equal Opportunity Employer.*

NMR AND PROTEIN ENGINEERING POSTDOCTORALS. Two positions now available. (1) Conduct high-resolution 1-, 2- and 3-D NMR studies of heme and nonheme proteins. NMR experience required. Use VXR500 and AMX300 spectrometers. Option to learn Protein Engineering. (2) Design, create, express, purify heme protein mutants. Option to learn molecular modeling and NMR. Appointment for 1 year with renewal possible, salary minimum $21,000. Send curriculum vitae to: **Professor James Satterlee, Chemistry Department, Washington State University, Pullman, WA 99164–4630.**

POSTDOCTORAL POSITION

Available to study by molecular genetic and biochemical approaches the structure, function, assembly and regulation of the expression of energy transduction complexes involved in photosynthesis and respiration with particular emphases on cytochromes from photosynthetic bacteria as model systems. (see *EMBO J.* **8**, 3951; *Biochemistry* **29**, 11249; and *PNAS* **88**, 492). Solid background and experience in molecular genetics, recombinant DNA techniques and/or biochemistry is desirable. For further information contact: **F. Daldal, telephone: 215-898-4394** and send curriculum vitae, description of research accomplishments, and references to: **Department of Biology, 204 Mudd Building, University of Pennsylvania, Philadelphia, PA 19104–6018; FAX: 215-898-8780.** *University of Pennsylvania is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION available for investigating the cellular and molecular biology of dopamine and serotonin receptors. Cell biology projects include studying receptor-effector coupling mechanisms, G protein interactions, and receptor regulation in clonal cell lines. Molecular biology projects involve cloning novel receptor subtype cDNA/genes, analysis and characterization of gene structure and regulation of gene expression. Send curriculum vitae and three letters of recommendation to: **Dr. David R. Sibley, National Institutes of Health, Building 10, Room 5C-108, 9000 Rockville Pike, Bethesda, MD 20892.**

POSTDOCTORAL POSITIONS AT OAK RIDGE NATIONAL LABORATORY: Four positions in murine molecular genetics available in Biology Division (with E. Rinchik, R. Woychik, L. Stubbs, and M. Mucenski) to study gene structure and function utilizing the mouse as a model system. Information/applications: **Postgraduate Research Program/Biology, Science/Engineering Education Division, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831–0117; telephone: 615-576-3456.**

A **POSTDOCTORAL POSITION** is available to study the regulation of potassium channels by G proteins in airway smooth muscle cells. Familiarity with patch-clamp and/or molecular biology techniques is desired. Please send curriculum vitae, and three references to: **Dr. M. I. Kotlikoff, Department of Animal Biology, University of Pennsylvania, 3800 Spruce Street, Philadelphia, PA 19104–6046.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITION available for recent Ph.D. interested in the cloning and expression of mammalian nucleoside transport proteins. Experience in molecular cloning methods and mammalian expression systems required. Send curriculum vitae and the names of three referees to: **Judith A. Belt, Ph.D., Department of Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, P.O. Box 318, Memphis, TN 38101.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITION is available July 1992 to study the proteolytic processing of the Alzheimer's amyloid β-protein precursor. Investigations will also focus on the functional properties of protease nexin-2, the isoform of amyloid β-protein precursor that contains a Kuntiz-type protease inhibitor domain. A Ph.D. in biochemistry or a related field required with experience in protein purification, enzyme assays, and cell cultures. Send curriculum vitae, statement of research interests, and names of three references to: **Dr. William E. Van Nostrand, Department of Microbiology and Molecular Genetics, College of Medicine, University of California, Irvine, CA 92717; telephone: 714-725-2556.**

An Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL POSITION IN IMMUNOLOGY/INFECTIOUS DISEASE. To study host defenses mediated by a calcium and zinc binding protein of neutrophils. Strong background in the methodology for isolation and purification of proteins desired. Salary is negotiable. Send curriculum vitae and names and addresses of three references to: **Dr. Peter G. Sohnle, Medical College of Wisconsin, Research Service/151, Veterans Administration Medical Center, Milwaukee, WI 53295.** *The Medical College of Wisconsin is an Equal Opportunity/Affirmative Action Employer, M/F/D.*

HUMAN GENOME PROJECT
SEQUENCING AND MAPPING
HUMAN BRAIN cDNAs

POSTDOCTORAL POSITIONS available to participate in the large-scale sequencing and physical and genetic mapping of cDNAs expressed in the human brain. Research will involve the use and development of advanced technologies for automated sequencing and mapping and for the large-scale handling and analysis of cDNA sequence and mapping data; strong interest in identification of genes involved in human neurogenetic diseases. Considerable experience with sequencing, mapping and/or DNA informatics desirable. Send curriculum vitae and names of three references to: **Dr. James M. Sikela, Department of Pharmacology C236, University of Colorado Health Sciences Center, 4200 East 9th Avenue, Denver, CO 80262.**

University of Colorado is an Equal Opportunity Employer.

POSTDOCTORAL POSITION
TOXICOKINETIC MODELING
UNIVERSITY OF WASHINGTON

A postdoctoral position is available as part of a multidisciplinary team to develop and evaluate in vivo toxicokinetic methodologies for quantifying human exposure to volatile compounds of environmental concern. Current work involves the development of physiologically based kinetic models for a series of alkylbenzenes based on human exposure data collected under controlled laboratory conditions using stable isotope-labeled compounds. Applicants should have a working knowledge of pharmacokinetic modeling and some experience in computer programming. Send curriculum vitae and three letters of reference to: **Danny D. Shen, Ph.D., Department of Pharmaceutics, BG-20, University of Washington, Seattle, WA 98195.**

POSTDOCTORAL POSITIONS
THE CLEVELAND CLINIC FOUNDATION

Postdoctoral positions available immediately to study the structure and function of peptide hormone receptors. Experience in protein chemistry, receptor biochemistry and/or enzymology is required. Send curriculum vitae and names/letters of reference to: **Dr. Kunio Misono, Research Institute, FF3-02, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195.**

POSTDOCTORAL POSITIONS IN MOLECULAR AND CELLULAR NEUROBIOLOGY for studies concerning (a) structure, function, and regulation of nicotinic acetylcholine receptors, (b) nuclear regulation of catecholaminergic gene expression, or (c) transgenic cell expression of growth factors. Investigations encompass molecular genetic, biochemical, immunological, and pharmacological approaches in a unique and dynamic institution. Send curriculum vitae, names and addresses of three references, and brief statement of research experience and objectives to either: **R. J. Lukas or M. K. Stachowiak, Division of Neurobiology, Barrow Neurological Institute, 350 West Thomas Road, Phoenix, AZ 85013.** *Equal Opportunity Employer.*

Bristol-Myers Squibb Pharmaceutical Research Institute is the R&D Division of Bristol-Myers Squibb, a worldwide leader in the discovery and development of innovative pharmaceuticals. We currently have opportunities available in the following departments:

CARDIOVASCULAR BIOCHEMISTRY

Sr. Research Investigator

This position will afford you the opportunity to contribute to ongoing programs in anti-thrombotic research including investigations into novel mechanisms of blood coagulation inhibition and identification of novel inhibitors of thrombin induced platelet aggregation and/or novel broad spectrum inhibitors of blood platelet activation. Candidates should possess a Ph.D. in a biological/biochemical discipline. Additional postdoctoral experience in the areas of blood coagulation biochemistry, platelet receptor/second messenger systems or monocyte/macrophage activation would be an asset. **Reply to Dept. 319-A-PF.**

Associate Research Scientist

Conduct transient transfections of wide-type and mutant clones encoding receptor proteins to study the expression and mechanism of action of receptors. Candidates should possess a BS in a biological/biochemistry discipline with additional experience in some of the following areas: transient transfection assays, subcloning, generation of stable transfectant cell lines, Northern & Southern analysis, and/or receptor binding. **Reply to Dept. 319-B-PF.**

VIROLOGY

Research Investigators

Candidates should have a Ph.D. in Molecular Biology, Biochemistry or Virology and previous postdoctoral experience. Successful candidates are expected to conduct independent research studies to define unique vital targets for antiviral intervention and collaborate with other research groups in the design and development of novel antiviral agents. **Reply to Dept. 319-C-PF.**

Associate Research Scientists

Candidates should have a BS/MS degree and previous experience working in a research laboratory. Prior training in the area of Molecular Biology, Biochemistry, Hybridomas or Virology is highly desirable. **Reply to Dept. 319-D-PF.**

METABOLIC DISEASES

Postdoctoral Scientist

Initiate studies on glucose utilization and metabolism in cell models of peripheral insulin-responsive tissues. Requirements include a Ph.D. degree, strong communication skills, a strong relevant research background in biochemical/cellular/molecular areas and an ability to interact with multidisciplined research groups. **Reply to Dept. 319-E-PF.**

Associate Research Scientist

You will be responsible for performing biochemical and cell biological analyses of enzymes and transporters involved in regulation of carbohydrate metabolism. Requirements include a BS/MS degree with relevant research experience, a knowledge of cellular metabolism and a strong background in biochemical/cellular/molecular techniques. **Reply to Dept. 319-F-PF.**

VETERINARY SCIENCES

Veterinary Associate

Currently, we are seeking an individual to have overall responsibility of the veterinary diagnostic laboratory and perform diagnostic and technical procedures in accordance with SOPs. This will include quality assurance testing and maintaining departmental and laboratory animal, supply and environmental records. Candidates must have BS/AAS in Biology, Microbiology, Medical Technology, Laboratory Animal Science, Clinical Chemistry with a minimum of 3-5 years relevant experience. **Reply to Dept. 319-G-JH.**

For consideration, please forward your resume, with appropriate department number to: **Bristol-Myers Squibb Pharmaceutical Research Institute, P.O. Box 4000, Princeton, NJ 08543-4000.** Equal Opportunity Employer, M/F/D/V.

Bristol-Myers Squibb Company

POSITIONS OPEN

A **POSTDOCTORAL POSITION** is available immediately for an individual with experience in the cytogenics of maize or closely related plant species. The studies undertaken will include generation of maize chromosome–specific and chromosome segment–specific libraries of RFLP probes by use of polymerase chain reaction technologies. Two years of support are initially available, and salary will be commensurate with experience. Anyone interested should contact: **Professor Jeff Bennetzen, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907.** *Purdue University is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL POSITION with a team investigating molecular biology of the vascular wall in growth and hypertension. Experience in molecular biology, cell physiology, in situ hybridization, intracellular signaling, or microcirculation desirable. Send curriculum vitae and names of three references to: **Russell L. Prewitt, Ph.D., Department of Physiology, Eastern Virginia Medical School, P.O. Box 1980, Norfolk, VA 23501.**

POSTDOCTORAL POSITION IN VIROLOGY available immediately to study the molecular mechanism of coronavirus transcription and recombination. Send curriculum vitae, and the name and address of three references to: **Dr. Susan Baker, Department of Microbiology, and Immunology, Loyola University Medical Center, 2160 South First Avenue Maywood, IL 60153.** *Equal Opportunity Employer.*

POSTDOCTORAL ASSOCIATE

Position available immediately for a postdoctoral associate to carry out research related to the improvement of the functional properties of bovine β-lactoglobulin. Extensive experience in molecular biology and protein chemistry is essential. This project will further develop existing systems for the engineering of a recombinant form of bovine β-lactoglobulin. A Ph.D. in biochemistry, food science, or other associated disciplines is required. Send curriculum vitae and names of references to: **Carl A. Batt, Department of Food Science, 413 Stocking Hall, Cornell University, Ithaca, NY 14853.** *Cornell University is an Equal Opportunity Employer.*

POSTDOCTORAL POSITION available, with funding for 3 years, in a project investigating mutations in the target enzyme as a mechanism of clinical resistance to an anticancer drug. Techniques of molecular biology and enzymology are being used to determine which mutations of the enzyme confer the greatest resistance while maintaining efficient catalytic activity. A search will be made for such mutations in tumor cells of patients relapsing during treatment with the drug. Ph.D. in biochemistry, cell biology or a closely related discipline required, and experience in directed mutagenesis, PCR and related techniques a major advantage. Salary as for NIH fellowships. Removal expenses reimbursed up to $1500, and professional development funds of $1000 annually. Send curriculum vitae with names of three references to: **Raymond L. Blakley, Ph.D., D.Sc., Department of Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, TN 38101.** *Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL POSITIONS IN MOLECULAR NEUROBIOLOGY are available to study the mechanisms by which muscle electrical activity and motoneuron-derived tropic factors regulate acetylcholine receptor gene expression. Experience with the techniques of molecular biology and/or second messenger systems required. Please send curriculum vitae and letters of reference to: **Dr. Daniel Goldman, University of Michigan, MHRI, 205 Zina Pitcher Place, Ann Arbor, MI 48109.** *The University of Michigan is an Equal Opportunity Employer.*

POSTDOCTORAL POSITION available immediately to study a unique intracellular protein trafficking pathway: A major Euglena chloroplast protein is derived from a polyprotein precursor that is transported into the ER and golgi apparatus prior to chloroplast localization. Position available to determine intracellular processing sites, identify processing domains and characterize processing reactions. Send curriculum vitae and three reference letters postmarked by 5 June to: **Dr. S. D. Schwartzbach, Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE 68588–0343.** *Affirmative Action/Equal Opportunity Employer.*

POSITIONS OPEN

POSTDOCTORAL POSITIONS. Available immediately. Research will center on the cell biology of the amyloid protein precursor and the pathologic role of this protein in Alzheimer's disease. Specifically the emphasis of this research will be to understand how proteolytic processing of the amyloid protein precursor is altered in Alzheimer's disease using transfected cell cultures as model systems [see *Science* **255**, 726–730 and **255**, 728–730 (1992)]. Candidates with expertise in molecular biology, mammalian cell culture (especially transfection techniques) and/or protein chemistry are desired.

Please send curriculum vitae and references to: **Dr. Steven G. Younkin, Institute of Pathology, Case Western Reserve University School of Medicine, 2085 Adelbert Road, Cleveland, OH 44106, telephone: 216-368-3381.**

POSTDOCTORAL FELLOW

Postdoctoral position available in the laboratory of Dr. M. McKinney, Ph.D., in the Alzheimer's Research Group at Mayo Clinic Jacksonville. On-going studies include molecular pharmacological studies of muscarinic receptor function in aging and in Alzheimer's disease, studies of the transcriptional regulation of muscarinic receptor subtypes and of genes related to the survival and plasticity of the central cholinergic phenotype. Persons with a strong interest in applying molecular techniques to the development of therapy and/or to understanding the biology of cholinergic neurodegeneration are encouraged to apply. Send curriculum vitae and names of three persons who can write letters of reference to: **M. McKinney, Ph.D., Mayo Clinic Jacksonville, 4500 San Pablo Road, Jacksonville, FL 32224.** *Equal Opportunity Employer. Smoke-Free and Drug-Free Workplace.*

PRE- AND POSTDOCTORAL FELLOWSHIPS MOLECULAR PARASITOLOGY

The Molecular Parasitology Training Program in the Division of Biological Sciences, University of Georgia, has immediate openings for pre- and postdoctoral fellows with an interest in the molecular and cell biology of parasites and vectors. This NIH-sponsored program offers training in parasitology with emphasis in the areas of molecular biology, biochemistry, immunology, cell biology and vector biology. With a staff of 18 faculty participants, this program combines the expertise of classical and modern parasitologists and immunoparasitologists with that of molecular biologists, cell biologists and biochemists to provide comprehensive and modern training in molecular parasitology. Among the topics currently under investigation are acute schistosomiasis in nonhuman primates, the biochemistry and molecular biology of GPI anchors in African trypanosomes, and immunoregulation and immunopathogenesis in American trypanosomiasis. *Funding is restricted to U.S. citizens or permanent residents.* For further information contact: **Molecular Parasitology Training Program, Department of Zoology, University of Georgia, Athens, GA 30602.** *The University of Georgia is an Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIPS IN HEPATOLOGY RESEARCH

NIH training grant–funded positions are available for a minimum of 2 years in an established interdisciplinary program in basic investigative hepatology. Interested individuals must have an M.D. and/or Ph.D. and a strong interest in developing an academic career in basic liver cell and molecular biology and/or pathophysiology. Send curriculum vitae and names of three references to: **Dr. Allan W. Wolkoff, Liver Research Center, Albert Einstein College of Medicine, Jack and Pearl Resnick Campus, 1300 Morris Park Avenue, Bronx, NY 10461.** *Equal Opportunity Employer.*

Two **USDA NATIONAL NEEDS GRADUATE FELLOWSHIPS** will be awarded at Kansas State University for doctoral studies in the water sciences. Fellows will receive an annual stipend of $17,000 for 3 years and will pursue the Ph.D. degree in the Departments of Agronomy, Agricultural Engineering, or Civil Engineering. *Applicants must be U.S. citizens.* Information can be obtained from **Dr. G. J. Kluitenberg, Department of Agronomy, Kansas State University, Manhattan, KS 66506; telephone: 913-532-7215.** *Equal Opportunity Employer.*

ASSISTANT/ASSOCIATE PROFESSOR
Microbiology/Biological Oceanography

The University of Rhode Island's Graduate School of Oceanography (GSO) invites applicants for a tenure-track Biological Oceanography Faculty Position, with specialization in Marine Microbiology, with associated skills in Biochemistry or Molecular Biology. The successful candidate will establish an active research program, advise graduate students, teach courses in Marine Microbiology and related subjects, and serve on committees appointed by the Dean of the Graduate School of Oceanography or in other service functions to the University, State, national or international communities as appropriate. Required: A Ph.D. in Microbiology or a closely related field and training in molecular biology or biochemistry before beginning work at GSO. Preference may be given to candidates with: 1. Postdoctoral research experience in marine microbes and their activities in relation to the ocean environment (e.g., their involvement with marine ecosystem structure, their role in the microbial loop, and their functions in chemical cycles); 2. potential to participate in GSO's new global and coastal research initiatives; 3. demonstrated excellence in teaching and advising graduate students. For the rank of Associate Professor, the applicant must have a demonstrated record of strong, independent research, including grants and publications. Applications will be reviewed beginning June 1, 1992 and continue until the position is filled. Submit a curriculum vitae, the names of four references, and a summary of research interests to: **Prof. Elijah Swift, Search Committee Chair, Position #091115, UNIVERSITY OF RHODE ISLAND, P.O. Box G, Kingston, RI 02881.** An Affirmative Action/Equal Opportunity Employer.

POSTDOCTORAL OPPORTUNITIES in Microbial Ecology

Researchers in the Center for Microbial Ecology, an NSF Science and Technology Center, seek to understand the basic principles that govern the competitiveness, diversity, and function of microorganisms in natural and managed environments. Research is conducted in the following areas: *Gene Flow and Molecular Evolution, Population Diversity, Community Diversity, Novel Organisms, Biotransformation, and Environmental Control of Gene Expression.*

Each year the Center seeks six or more postdocs in the fields of microbiology, molecular biology, chemistry, ecology, soil science, mathematics, and chemical and environmental engineering. We are initiating the search for applicants interested in positions over the next 12 months. Appointments are normally for two years. The multidisciplinary nature of the Center and the opportunity to collaborate with scientists from industry, regulatory agencies, and several foreign countries provide an excellent way to broaden one's background. Interested individuals are encouraged to submit a curriculum vitae and names of three references to the post-doc coordinator, Dr. Frans J. deBruijn, at the address given below. *MSU is an affirmative action/equal opportunity employer.*

CENTER FOR MICROBIAL ECOLOGY
MICHIGAN STATE UNIVERSITY
540 Plant & Soil Sciences Building
East Lansing, MI 48824-1325
Phone: (517) 353-9021 Fax: (517) 353-2917
Bitnet Address: 21394jmt@MSU.BITNET

OPHIDIAN Pharmaceuticals, Inc.

Research & Clinical Scientists

OPHIDIAN is a rapidly growing biotechnology firm developing pharmaceutical and diagnostic products, with a current emphasis on novel antimicrobial, antitoxin and antivenom immunotherapeutics.

We are continuing expansion of our R&D and clinical research activities and have positions available for highly motivated research professionals with experience in one or more of the following areas:

- **Medical microbiology**
- **Immunochemistry**
- **Toxinology**
- **Clinical affairs**

We have several immediate openings for entry level Ph.D.'s to research supervisors, and anticipate additional openings in upcoming months.

We offer competitive salaries and a full range of benefits. Please send your CV describing your qualifications and career interests, to:

Dr. Margaret van Boldrik
OPHIDIAN Pharmaceuticals
2800 S. Fish Hatchery Rd.
Madison, WI 53711

Intensely focused on the solutions

Creating an organ transplantation technology that minimizes systemic immunosuppression and is applicable to most vascularized organs is a complex process. Our Cellular Immunology/Hematology, Molecular Biology and Monoclonal Antibody Departments will be collaborating to develop technologies to induce specific immune tolerance in humans through bone marrow manipulation.

Senior Scientists

CELLULAR IMMUNOLOGY/HEMATOLOGY (2)
To qualify for this Ph.D. level position, you must have 2 or more years of post-doctoral experience in Cell Biology with an emphasis in Hematopoiesis. Experience in non-rodent mammalian species with long-term bone marrow cultures (LTBMC) and/or in vivo bone marrow transplantation is also required. Industrial experience is a plus.

MONOCLONAL ANTIBODY In addition to a Ph.D., you must have 2 or more years of post-doctoral experience with expertise in the use of bioreactors for intermediate to large-scale production of monoclonal antibodies. Industrial experience is a must, with knowledge of regulatory requirements for GLP and/or GMP production a plus.

Everything we do is imbued with this clear goal: to fulfill the unmet demand for organs to treat people suffering from end-stage organ failure. If you are interested in a truly collaborative, participatory science that is focused on practical applications, send your resume to: **Human Resources, BioTransplant, Inc., Bldg. 96, 13th Street, Charlestown Navy Yard, Charlestown, MA 02129.** We are an equal opportunity employer.

BIOTRANSPLANT
INCORPORATED

Analytical Group Leader

Pharmatec, Inc. is seeking an expert in **analytical chemistry** to **head** its new analytical group. Individuals with a **Ph.D.,** excellent communication skills and 5 years experience in pharmaceutical or industrial analysis with background in methods development and validation procedures, especially HPLC, are encouraged to apply. **Pharmatec, Inc.** is a growing research and development company which is expanding into state of the art laboratory facilities at the **University of Florida Research Foundation Progress Center Park.** The corporation is dedicated to developing innovative new chemical entities designed for **targeted drug delivery.** Qualified scientists interested in joining a dedicated research and development team where their contributions will make a **significant impact** on emergent therapeutic strategies are encouraged to apply in confidence to:

Pharmatec, Inc.
re: Analytical Head
P.O. Box 730
Alachua, FL 32615

The laboratory is located in a progressive southern university community which offers an **outstanding climate,** numerous **recreational** opportunities and exceptional **cultural** facilities with multiseasonal concert, theater, and fine arts programs.

SYMPOSIUM

International Symposium on
Tobacco Smoking and Nutrition:
Influence of Nutrition on Tobacco Associated Health Risks

September 14–16, 1992, Lexington, Kentucky

This two and one-half day symposium assembles authorities from the world-wide scientific community to focus on whether nutrition and diet have an influence on tobacco smoking related health risks. Topics include:

Tobacco Smoking and Free Radical Biology
R. Jenkins (USA), W. Pryor (USA), E. Niki (Japan), R. Anderson (South Africa), H. Sies (Germany)

Tobacco Smoking, Nutrition and Cardiovascular Disease
Y. Stein (Israel), R. Bernhardt (Germany), G. Duthie (Scotland), R. Thompson (England), C. Cross (USA), T. Kita (Japan), B. Hennig (USA)

Tobacco Smoking, Carcinogenic Agents and Chemoprevention
D. Hoffman (USA), W. Caldwell (USA), F.-L. Chung (USA), A. Castonquay (Canada), T. Edes (USA), J. Bertram (USA), D. Heimburger (USA)

Tobacco Smoking, Nutrition and Lung Disease
N. Krinsky (USA), P. Knekt (Finland), J. Schwartz (USA), P. Leanderson (Sweden), C. Chow (USA), J. Gosney (England)

Diet and Tobacco Smoking
S. Renaud (France), A. Subar (USA), G. Colditz (USA), G. Schectman (USA), C. Bolton-Smith (England), R. Ziegler (USA)

Featured Speaker: E. Wynder (USA)

Symposium Information:
University of Kentucky
Tobacco and Health Research Institute
Telephone: (606) 257-5151
FAX: (606) 258-1077

Symposium Registration:
University of Kentucky
Special Programs
Telephone: (606) 257-3929
FAX: (606) 257-5171

Genetics Computer Group

Software Developer

The Genetics Computer Group (GCG), producer of the widely acclaimed *Wisconsin Sequence Analysis Package*, is looking for someone to help develop software for DNA and Protein sequence analysis. Applicants should have a strong background in computing and biology. Responsibilities will include developing new programs, modifying existing programs, and converting programs from outside sources. In addition to programming, the successful candidate should have good communication, writing, and social skills.

Technical Editor

GCG is also looking for someone to help edit its documentation and marketing materials. Applicants with a background in biology and computing will be preferred. Candidates will have to demonstrate skill and experience in editing, and will need to have good communication, writing, and social skills.

The Genetics Computer Group offers an attractive compensation and benefits package as well as relocation assistance. Madison, Wisconsin and the surrounding areas are highly regarded for their educational systems and quality of life.

Please send resumes to:
Dr. Irv Edelman
Genetics Computer Group, Inc.
575 Science Drive, Suite B
Madison, Wisconsin, 53711

The University of British Columbia

Search Extended

Department of Microbiology

Applications are invited for a tenure-track Assistant Professor position in the Department of Microbiology, at U.B.C. This position is one of three funded by an award for a NSERC/COFI Chair in Forest Products Waste Management. Applicants should have a Ph.D., postdoctoral experience and a strong research record.

The preferred candidate would have a background in microbial physiology, metabolism, genetics, or environmental microbiology. It is expected that the candidate will have the potential to develop a world class research program and that this research will impact on forest industry waste products and will complement existing programs in Microbiology and other related departments. There will be significant opportunities to interact with existing and developing programs in waste management and in designing approaches to the sustainable development of natural resources. The individual will participate in undergraduate teaching and in the active Ph.D. program in the Microbiology Department.

Deadline for applications is **June 1, 1992,** with an appointment to be effective **January 1, 1993 or earlier if appropriate.** Salary will be commensurate with qualifications and experience. The University of British Columbia encourages qualified women and minority candidates.

In accordance with Canadian immigration requirements priority will be given to Canadian citizens and permanent residents. The position is subject to final budgetary approval. Please submit application, together with the names of three referees to:

Dr. Julian E. Davies, Head
Department of Microbiology
University of British Columbia
#300 - 6174 University Boulevard
Vancouver, B.C., CANADA V6T 1Z3

Dean, School of Graduate Studies

Nomination and/or applications are requested for the position of Dean, School of Graduate Studies, Meharry Medical College.

A historically black institution, Meharry was founded in 1876. The School of Graduate Studies was established in 1972 and now offers the Ph.D. in biochemistry, microbiology, pharmacology, physiology, and biomedical sciences, as well as the M.D./Ph.D. degree. The Master of Science degree in Public Health is offered with major emphasis in occupational medicine, preventive medicine, health services administration, public health administration, and public health nutrition. The potential exists for expanding the Ph.D. program to other areas of interest.

The Dean of the School of Graduate Studies has the overall responsibility to provide leadership for all graduate programs in the College and to manage restricted and unrestricted budgets of the Graduate School.

The Graduate Dean is the chief academic and administrative officer of the Graduate School and works closely with other Deans, Vice Presidents and the President. The Dean reports directly to the Vice President for Academic Affairs.

Candidates should hold the terminal degree in a biomedical science discipline and be eligible for a tenured appointment to the graduate faculty. A strong background in research, a distinguished record of accomplishments as an administrator and experience in procurement of extramural funding are essential. Candidates should have excellent communication skills and be able to work effectively in a university environment, as well as with extramural agencies. The recruited individual is expected to enhance the growth of research programs, sustain excellence in graduate programs, encourage the development of new graduate programs commensurate with Meharry's resources and stimulate interaction between basic science and clinical investigators.

Nominations and/or applications will be accepted until the position is filled. Applicants should submit a letter of interest addressing special qualifications, detailed resume and a list of five references to:

James G. Townsel, Ph.D.
Chairperson, Search Committee
c/o Department of Physiology
Meharry Medical College
1005 D. B. Todd Blvd.
Nashville, TN 37208

Meharry Medical College is an equal opportunity/affirmative action employer. Minority and women candidates are encouraged to apply.

Meharry Medical College

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At BioCryst Pharmaceuticals, Inc., we have developed a multidisciplinary approach to the fast and efficient discovery and development of novel small molecular weight pharmaceuticals which act on intra- or extracellular biological macromolecular targets.

Our growth has created several new positions in the areas of:

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BioCryst Pharmaceuticals, Inc.
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2190 Parkway Lake Drive, Suite B
Birmingham, AL 35244

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Our client, a long-established and highly reputed international pharmaceutical firm, has retained Sampson, Neill & Wilkins to fill this challenging key position at their state-of-the-art Corporate/R&D Center in the Northeast. Choice of desirable life styles, urban to rural.

This newly defined position reports to the head of R&D and will manage a staff of over 150 scientific personnel, 40% of whom hold Ph.D. degrees. The staff, which will grow to over 200, is organized into Biochemistry, Molecular Biology, Medicinal Chemistry, Immunology, and Pharmacology Departments. The main thrust of the research is directed toward medical disorders which have a virology or immunology basis.

The successful candidate will have an M.D. and/or Ph.D degree with a significant and published record of accomplishment conducting and directing relevant research with sizable research groups. Scientific training in biochemistry and molecular biology with research interests in virology or immunology based on concepts of modern biology would be most appropriate.

This is a position with superior compensation and advancement opportunities. To inquire further, please submit your curriculum vitae (including bibliography) in confidence to William T. Jackson, Vice President.

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CABM SYMPOSIUM
October 22-23, 1992

Structure-Function of HIV and Novel Approaches to Therapy

Edward Arnold
Patrick Brown
Charles Craik
Clyde Crumpacker
Ronald Desrosiers
Emilio Emini
Thomas Folks
Stephen Harrison
Stephen Hughes
Paul Janssen
Arnold Rabson
Chang-Yi Wang
Flossie Wong-Staal

Registration Information:
CABM Symposium, 679 Hoes Lane, Piscataway, New Jersey 08854
$50 Registration; Students, Post-Docs free (*provide certification*);
$10 Box lunch for October 22 (*Register before October 9, 1992*)
$105 Overnight at Hyatt Regency, New Brunswick, New Jersey 08901
(Make reservations at 908-873-1234 before October 1)

RUTGERS
UMD

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NYU Medical Center

Assistant Research Scientist

We currently have a Post Doctoral position available in the laboratory of Dr.Robert Boorstein to study molecular biology and chemistry of DNA damage and DNA repair. You'll participate in the characterization of newly developed DNA repair mutants and in understanding the role of DNA repair in enzymes in preventing mutagenesis and carcinogenesis.

Experience in biochemistry, chemistry, or molecular biology is desirable. Salary is competitive.

Please send your C.V. to Ms. Singh, Human Resources Dept., NYU Medical Center, 550 First Avenue, New York, NY 10016. EOE, M/F.

As an emerging biopharmaceutical company, T CELL SCIENCES leads the industry in developing complement and T cell receptor based therapeutics. We are turning scientific advances into drug candidates with the goal of treating human diseases of inflammation, autoimmunity, and cancer. The Company's first therapeutic is expected to enter human clinical trials in 1992.

IMMUNOLOGY

Senior Scientist

Significant career opportunity to be responsible for designing and executing research and development efforts of potential T cell receptor-based therapeutic proteins. Requires Ph.D. in immunology or closely related field, and minimum 2 years relevant postdoctoral or industrial experience. A demonstrated capability for project planning and coordination, and clear record of accomplishment is expected. Additional experience with PCR or preparation/characterization of monoclonal antibodies desirable. Prefer individuals with experience in cellular immunology of human systems.

MOLECULAR BIOLOGY

Senior Scientist

Key growth opportunity to participate in state-of-the-art environment investigating protein expression, receptor/ligand interactions, cell biology and immunology of autoimmune diseases. Requires Ph.D. in molecular biology, microbiology, immunology or biochemistry, with postdoctoral training. Preference for candidates with background in both molecular biology and immunology. Experience in biotechnology industry a plus.

T CELL SCIENCES, INC. offers competitive compensation, comprehensive benefits, a progressive work environment, and opportunity for significant career advancement. For immediate consideration please forward resume to: Paula R. Freeman, T CELL SCIENCES, INC., 38 Sidney Street, Cambridge, MA 02139.

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T CELL SCIENCES

POSITIONS OPEN

POSTDOCTORAL FELLOWSHIP. Position available 1 June 1992, for cell biologist/biochemist to study growth factor control of fish myogenic cells. Project includes basic cell culture, defined medium formulation, growth factor/cell bioassays, receptor characterization, and growth factor–receptor signaling mechanisms. Candidates should send résumé and three letters of recommendation to: **Dr. Mike Dodson, Department of Animal Sciences, Washington State University (WSU), Pullman, WA 99164–6320.** Screening begins 14 May 1992. *WSU is an Equal Employment Opportunity/Affirmative Action Educator and Employer. Protected groups are encouraged to apply.*

POSTDOCTORAL FELLOWSHIP. Applications are invited from recent Ph.D., M.D. or D.V.M. candidates for a postdoctoral fellowship in radiopharmaceutical research applied primarily to cancer diagnosis and therapy. Applicants with strong interest in biochemistry, organometallic chemistry, synthetic organic chemistry and receptor science would be preferable. Competitive salary is offered. *Candidate must be permanent U.S. citizen.* Send résumé and references to: **Dr. M. L. Thakur, Nuclear Medicine, 804 Main Building, Thomas Jefferson University, Philadelphia, PA 19107.** *Thomas Jefferson University is an Affirmative Action, Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIP AND RESEARCH TECHNICIAN positions available 1 July 1992 to study gene transfer into somatic cells. Research is focused on (1) understanding the effects of genetic modification on basic cell biology and cell function, and (2) development of novel therapeutic approaches using gene-modified cells. The laboratory is actively involved in one of the first human gene therapy clinical trials to treat cancer. Experience in cell culture or molecular biology required. Send curriculum vitae and three references to: **Dr. Scott M. Freeman, Department of Pathology-SL79, School of Medicine, Tulane University, 1430 Tulane Avenue, New Orleans, LA 70112.**

POSTDOCTORAL FELLOWSHIPS
CANCER BIOLOGY TRAINING PROGRAM
MEDICAL COLLEGE OF VIRGINIA

FUNCTIONS OF *c*-MYB IN HUMAN HEMATOPOIESIS—Studies on both regulation and structure/function of the *c*-myb proto-oncogene in hematopoietic and immune cell proliferation and differentiation. Effects of alternative splicing on activity of the myb proteins. Contact: **Dr. Eric Westin, Departments of Microbiology/Immunology and Medicine.**

REGULATION OF CELL GROWTH BY ONCOGENE EXPRESSION—Studies on the relationship between the expression of the myc family of nuclear oncoproteins and the expression of growth factor and growth factor receptor genes in human malignancies. Contact: **Dr. Geoffrey Krystal, Departments of Microbiology/Immunology and Internal Medicine.**

MOLECULAR GENETICS OF FOLATE TRANSPORT—Studies on the mechanisms by which transposable retroviral elements modulate the transcription, transcript processing and translation of folate membrane transport proteins. Contact: **Dr. J. David Goldman, Departments of Pharmacology and Internal Medicine.**

The Cancer Biology Postdoctoral Training Program is supported by an NCI-funded training grant. There is extensive faculty and trainee collaboration and utilization of cancer center shared resources. Starting stipend—$25,000 per year. Contact directors of laboratories noted above at the **Medical College of Virginia, MCV Box 230, Richmond, VA 23298–0230.** *U.S. citizenship or permanent residence status is required. The Medical College of Virginia is an Equal Opportunity Employer. Women and minorities are encouraged to apply.*

POSTDOCTORAL FELLOWSHIP: Unique opportunity for recently trained Ph.D. at National Jewish Center for Immunology and Respiratory Medicine (NJCIRM), Denver, Colorado (affiliated with University of Colorado Health Sciences Center). Position available after 1 July 1992, to study molecular biology of oxygen toxicity to the lung. Special restrictions apply to federal training grants: *U.S. citizenship or proof of permanent residency required.* Molecular biology experience essential. Protein biochemistry and tissue culture experience preferred. Familiarity with free radical biochemistry useful. Applicant submit letter stating interest, curriculum vitae and names of three references: **C. W. White, M.D., Pediatric Pulmonology, NJCIRM, 1400 Jackson, Denver, CO 80206.** *An Equal Opportunity/Affirmative Action Employer.*

POSITIONS OPEN

POSTDOCTORAL FELLOW. Position available for a postdoctoral fellow to investigate the structure and function of the cytochrome $P450_{BM-3}$ from *Bacillus megaterium*. Applicant should have experience in molecular biology and an interest in protein structure. To apply or to obtain further information please contact: **David A. Mullin, Department of Cell and Molecular Biology, Tulane University, New Orleans, LA 70118; telephone: 504-865-5545.** *Tulane University is an Affirmative Action/Equal Opportunity Employer and women and minorities are encouraged to apply.*

POSTDOCTORAL FELLOW. Position (2 or more years) available—group studying mechanisms involved in development and progression of malignant mesenchymal tumors. Experience in molecular biology techniques essential; experience in protein purification preferred. Send curriculum vitae and three references to: **T. K. Das Gupta, M.D., Ph.D., Cancer Center, University of Illinois, 840 South Wood Street (M/C 820), Chicago, IL 60612.** *University of Illinois is an Equal Opportunity/Affirmative Action Employer.*

PATHOLOGY. POSTDOCTORAL FELLOW in experimental pathology. M.D. or Ph.D. Two years of experience necessary in preparation and interpretation of retinal digest preparations of human and animal models of diabetes mellitus. Starting salary: $28,700 per year. Applications should be submitted to: **A. Bennett Jenson, M.D., Department of Pathology, Georgetown University Medical Center, 3900 Reservoir Road, NW, Washington, DC 20007.** *Georgetown University is an Affirmative Action/Equal Opportunity Employer.*

POSTDOCTORAL FELLOWSHIP. Immediately available to study novel human proteases. Applicant should be a biochemist with experience in protein and peptide chemistry. Send curriculum vitae and names of three references to: **Dr. James F. Lenney, Pharmacology Department, School of Medicine, University of Hawaii, 1960 East West Road, Honolulu, HI 96822.** *An Equal Opportunity Employer.*

POSTDOCTORAL FELLOW. Funded position to apply new, ultra-rapid physical methodologies to genomic analysis. Applicant should have extensive molecular cytogenetic and/or genomic analysis experience. Send curriculum vitae and names of three references to: **Dr. David C. Schwartz, New York University, Keck Foundation Laboratory for Biomolecular Imaging, Department of Chemistry, 31 Washington Place, New York, NY 10003.** *Equal Opportunity Employer.*

RESEARCH GRANTS AND FELLOWSHIPS

The American Epilepsy Society and the Epilepsy Foundation of America offer research grants and fellowships. Application deadline: 1 September 1992. For more information write:

Epilepsy Foundation of America
Research Administration
4351 Garden City Drive
Landover, MD 20785, telephone: 301-459-3700

POSTDOCTORAL AND GRADUATE TRAINING IN INSECT NEUROBIOLOGY

The Arizona Research Laboratories Division of Neurobiology, a research unit (13 tenure-track and research faculty, 66 trainees and staff) devoted to cellular, developmental, and molecular neurobiology and neuroethology of insects, invites inquiries from prospective postdoctoral fellows and predoctoral students. Inquiries, including résumé, statement of interests and plans, and names and addresses of three references, should be sent to: **Dr. John G. Hildebrand, Director, ARL Division of Neurobiology, 611 Gould-Simpson Building, University of Arizona, Tucson, AZ 85721.** *The University of Arizona is an Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL/RESEARCH ASSOCIATE POSITION: University of California. Cellular immunology and molecular biology of the role of **INTEGRINS** in intestinal inflammation. Familiarity with intra-epithelial lymphocyte isolation and immunological functions desirable. Write to: **Dr. D. Hollander, C340 Medical Sciences Building I, University of California, Irvine (UCI), CA 92717. FAX: 714-856-7454.** *UCI is an Affirmative Action/Equal Opportunity Employer.*

TEXAS A&M UNIVERSITY
PROFESSOR AND HEAD DEPARTMENT OF RANGELAND ECOLOGY AND MANAGEMENT

Texas A&M University invites applications for the position of Professor and Head of the Department of Rangeland Ecology and Management. The Department consists of 30 faculty, including 7 extension faculty and 9 off-campus research faculty, and approximately 50 graduate and 90 undergraduate majors placing it among the largest range science programs in the Nation. The department head functions as an administrator in the College of Agriculture and Life Sciences, the Agricultural Experiment Station, and the Agricultural Extension Service with responsibilities for a statewide program. Responsibilities include intellectural and philosophical leadership, management of Departmental resources, and principal liaison with external organizations. Required qualifications include an earned Ph.D. in range science, ecology or related discipline and demonstrated capability for leadership, management, and program integration. Send curriculum vitae and the names, addresses and phone numbers of five references, by 1 July 1992, to Dr. David D. Briske, Chair, Search Advisory Committee, Department of Rangeland Ecology and Management, Texas A&M University, College Station TX 77843-2126 [Phone: (409) 845-7332; Fax: (409) 845-6430]. Texas A&M University is an Equal Opportunity/Affirmative Action Employer.

Center for Recombinant Gamete Contraceptive Vaccinogens

Postdoctoral research positions are available for qualified individuals to receive training in various aspects of contraceptive vaccine development within the context of a multiinstitutional, multidisciplinary NIH-sponsored center. Training is possible with one or several of the following investigators at participating universities: **1) Dr. Roy Curtiss, Washington University**. *Recombinant avirulent Salmonella vaccines and reproductive tract immune response analysis*; **2) Dr. Erwin Goldberg, Northwestern University**. *Identification and cloning by immunologic and recombinant DNA technologies of cognate antigens responsible for human infertility*; **3) Dr. Michael O'Rand, University of North Carolina**. *Molecular biology of sperm and testis proteins which are involved in gamete recognition, zona pellucida binding and penetration, including both sperm lectins and enzymes*; **4) Dr. Kenneth Tung, University of Virginia**. *Mechanisms of regulation and pathogenesis of autoimmune diseases of the ovary and the testis*; **5) Dr. John Herr, University of Virginia**. Molecular biology of spermatogenesis; contraceptive vaccine development; **6) Dr. Charles Flickinger, University of Virginia**. *Cell biology of the male reproductive tract; effects of vasectomy*; **7) Dr. Richard Wright, University of Virginia**. *Testis specific gene expression; scale up of recombinant proteins.* Candidates should have a Ph.D. or M.D. degree and a strong record of publications involving any or several approaches: immunology, vaccinology, recombinant DNA, protein expression, monoclonal antibody-antigen characterization, secretory immunity or reproductive biology. Send curriculum vitae and names of three references to: Ms. J. M. ("Mollie") Kitchen, Center for Recombinant Gamete Contraceptive Vaccinogens, Department of Anatomy and Cell Biology, University of Virginia Health Sciences Center, Box 439, Charlottesville, VA 22908. Specify investigator and institution of preference for postdoctoral training. The universities involved in this center are equal opportunity/affirmative action employers.

Hahnemann University

Philadelphia, Pennsylvania

CHAIR OF DEPARTMENT OF MEDICINE

Hahnemann University invites nominations and applications for the position of Chair of the Department of Medicine.

THE UNIVERSITY

Hahnemann University is a modern academic health center in dynamic Philadelphia with approximately 2,000 students enrolled in its School of Medicine, Graduate School, and School of Health Sciences and Humanities. There are 694 medical students, 300 residents and fellows, and a University Hospital with 616 beds. In 1991, there were over 20,000 admissions, 177,000 patient days, and 275,000 ambulatory visits.

THE DEPARTMENT

The Department of Medicine has a full-time faculty of 76 and a volunteer faculty of 367 physicians in Philadelphia, distributed among 11 divisions. In addition, there are numerous volunteer faculty at six affiliated hospitals throughout Pennsylvania and New Jersey. Currently, the department has 118 residents and fellows. During the 1991 calendar year there were approximately 18,000 inpatients admitted and more than 52,000 ambulatory and Emergency Room visitors treated.

THE POSITION

The Chair is the chief academic and administrative officer for the department, and is responsible for its undergraduate medical, graduate medical, and continuing educational programs. In addition, the Chair leads the investigational and clinical efforts of the department.

QUALIFICATIONS

Candidates should have demonstrated success as a leader in an academic health center in such roles as department chair, vice chair, division director, or residency director, and should have nationally recognized professional stature. Candidates should have approximately 15 years experience as a faculty member. They should be recognized as superior clinicians and educators who are prepared to lead a restructuring of the department's educational programs to increase the proportion of graduates who choose generalist careers. Particular emphasis is placed on the ability of candidates to attract and lead investigators and research teams to develop new programs which will attract external peer-reviewed funding.

APPLICATIONS/NOMINATIONS

Screenings of the candidates for the position will begin IMMEDIATELY and continue until the position is filled. Applications, including letter of interest and current curriculum vitae, should be promptly forwarded to:

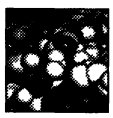
S. Craighead Alexander, M.D.
Chair, Search Committee for Chair of Department of Medicine
c/o Sheila Moriber Katz, M.D., M.B.A.
Associate Dean for Academic Coordination

HAHNEMANN UNIVERSITY

Mail Stop 435, Broad and Vine Streets
Philadelphia, Pennsylvania 19102

Hahnemann University is an Equal Opportunity, Affirmative Action Employer and invites and encourages applications and nominations from women and under-represented minorities.

Enzytech, Inc. of Cambridge, a leader in the development of controlled release systems for therapeutic proteins, is currently seeking outstanding individuals in the following areas:



PROTEIN RESEARCH SCIENTIST

To participate in formulating protein drugs for controlled release of proteins from polymeric matrices. Knowledge of relevant spectroscopic, chromatographic and electrophoretic techniques is necessary. Good communication skills and a strong publication record are a plus. The ideal candidate will have a Ph.D. in Physical Biochemistry or Biochemistry with 0-3 years of experience examining structural stability of proteins with respect to their function.

POLYMER CHARACTERIZATION RESEARCH SCIENTIST

To participate in ongoing programs for designing polymeric systems for controlled release systems. A strong background in polymer characterization and drug delivery is necessary. Experience with biocompatible polymers and protein pharmaceutics is a plus. The candidate should have a Ph.D. in Chemical Engineering or Material Science or Polymer Chemistry (0-3 years of experience).

DRUG DELIVERY RESEARCH SCIENTIST

To conduct research and development studies on delivery systems with particular emphasis on system evaluation, characterization and optimization. A strong background in analytical techniques is necessary. A background in pharmaceutical unit operations and experience with proteins or peptides is advantageous. The candidate should have a Ph.D. in Chemical Engineering or Physical Chemistry or Pharmaceutics (0-3 years of experience).

Enzytech

We provide an attractive, comprehensive compensation and benefits package as well as excellent advancement opportunities. For immediate consideration, please send a CV, in confidence, to: Enzytech, Inc., Human Resources Dept., 64 Sidney Street, Cambridge, MA 02139. An Equal Opportunity Employer.

SCIENTIST IV
Molecular Biology

The Hyland Division of Baxter Healthcare Corporation, a leader in the area of human plasma-derived protein therapeutics, is undertaking the development of its next generation of therapeutics with the aid of state-of-the-art biotechnology. We are seeking a talented and energetic individual to work as an integral member of multi-disciplinary project teams in our Research and Development Laboratory's Molecular Biology department.

The position requires a doctoral degree plus relevant graduate or postdoctoral experience. Responsibilities will include the establishment of new technologies for product support and development. Research will focus on antibody engineering and expression.

Demonstrated skill in the cloning or engineering of proteins will be essential. Experience with immunoglobulin genes, chimeric proteins, or stable mammalian expression systems will be the hallmark of the superior candidate. Hyland's recent emphasis on the use of cell culture-derived products as human therapeutics provides an opportunity for professional growth.

The name Baxter Healthcare Corporation is synonymous with products, systems and services devoted to improving health care throughout the world. We are a Fortune 100 company providing a smoke-free work environment, competitive compensation and benefits. Please send your resume along with a cover letter summarizing your qualifications and salary history in confidence to: **Baxter - Hyland Division, Human Resources Dept. LD/M-4, , 1710 Flower Ave., Duarte, CA 91010.** An Affirmative Action / Equal Opportunity Employer. Employment is contingent upon the result of a drug screening test.

Hyland Division

Baxter

POSITIONS OPEN

POSTDOCTORAL RESEARCH ASSOCIATE POSITION is available to study cell cycle regulation of topoisomerase II gene expression in mammalian cells or alterations in topoisomerase II structure associated with cellular resistance to drugs that interact with topoisomerase II. Training and experience in molecular biology and recombinant DNA techniques will be favored. Applicants must have a Ph.D. or equivalent degree. Position is available for up to 3 years with competitive salary and benefits. Submit curriculum vitae and names of three references to: **D. Parker Suttle, Department of Biochemical and Clinical Pharmacology, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, TN 38101.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL ASSOCIATE-RESEARCH

A position available to conduct human nutrition research using stable isotopes. Studies will be carried out in the field and in the clinical research center on site. Research areas include energy, fatty acid and carbohydrate metabolism with emphasis on obesity research and lipoprotein metabolism. Research facilities, scientific environment and funding for these studies are excellent. Minimum requirements: Doctoral degree: Ph.D., D.V.M., M.D., D.Sc. in biomedical science. Salary dependent on qualifications and experience. Application deadline is 15 June 1992 or until suitable applicant is found. Submit résumé, curriculum vitae, statement of research interests and three letters of recommendation to:

Evelyn P. Bennett, Assistant Director, HRM
Ref: G. A. Bray/J. P. DeLany
Pennington Biomedical Research Center (PBRC)
6400 Perkins Road
Baton Rouge, LA 70808

Louisiana State University/PBRC is an Equal Employment Opportunity/Affirmative Action Employer.

POSTDOCTORAL RESEARCH ASSOCIATE REGULATORY LIPID BIOCHEMISTRY AND CELL BIOLOGY

A postdoctoral position is available to participate in an ongoing research program focused on the molecular characterization of phosphatidylcholine-specific phospholipase C and its function in growth factor signal transduction. Candidates with a recent Ph.D. degree interested in joining a multidisciplinary group applying contemporary techniques of molecular biology and biochemistry to the role of lipid metabolism in signal transduction should submit their curriculum vitae, reprints and names of three references to: **Dr. Charles O. Rock, Biochemistry Department, St. Jude Children's Research Hospital, 332 North Lauderdale, Memphis, TN 38101.** *An Equal Opportunity/Affirmative Action Employer.*

POSTDOCTORAL RESEARCH ASSOCIATE DUKE UNIVERSITY MEDICAL CENTER

Position available for new or recent Ph.D. with molecular biology or protein purification experience to work in laboratory investigating the biochemical and genetic basis of blood group antigen expression by cell surface proteins. Current laboratory projects include protein isolation, epitope mapping, cloning of cDNA, gene structure, and expression of proteins via transfection in mammalian cells. Position may be assumed on or after 1 July 1992, and will be for a minimum of 1 year. Send curriculum vitae, with names of three references and statement of interests, to: **Marilyn Telen, M.D., Box 3387, Duke University Medical Center, Durham, NC 27710. FAX: 919-681-5864.** *An Equal Opportunity/Affirmative Action Employer.*

RESEARCH ASSOCIATE. The Center for AIDS Research at Stanford University to supervise immunologic studies. Will be expected to establish independent research programs and to collaborate with a multidisciplinary group in studying HIV disease pathogenesis and treatments. The work will consist of supervising technicians and performing HIV-specific in vitro immunologic tests, monitoring patients and designing trials for HIV immunotherapy. It is anticipated that cell sorter experience as well as cloning of lymphocytes will be required in planned studies. Candidate must have relevant postdoctoral experience with the cellular immunology of HIV, as well as experience with HIV clinical trials therapy. Interested individuals should apply to: **Thomas C. Merigan, M.D., Center for AIDS Research, Room S-156, Stanford Medical Center, Stanford, CA 94305.**

POSITIONS OPEN

POSTDOCTORAL RESEARCH OPPORTUNITIES IN INDIA. Research fellowships in India will be awarded through U.S. Agency for International Development program to *U.S. citizens* in 1993. Priority areas of research include: atmospheric/environmental sciences, biology, biotechnology, chemistry, computer software, electronics, forestry, geology, marine science, materials science, microelectronics, oceanography, physics, solid-state electronics, water resources, and other appropriate fields. For application and proposal guidelines, contact: **Jeanine M. Daniels, Academy for Educational Development, 1255 23rd Street, NW, Washington, DC 20037.**

RESEARCH ASSOCIATE/ASSISTANT. Cardiovascular Biophysics/Surgical Laboratory seeks a full-time investigator with strong research background and demonstrated expertise. Areas of research include: myocardial perfusion/energetics, cardiac mechanics/imaging and neural control of heart/circulation. Candidates with doctorate are encouraged to apply. Unusually talented research scientists with B.S. and/or M.S. in physiological, biophysical or bioengineering Sciences, 5 years of relevant experience and ability to work independently will also be considered. Send curriculum vitae, visa status, and name/telephone number of three references to: **Dr. J. Y. Kresh, Director, Cardiothoracic Research, Hahnemann University, Broad & Vine Streets, M.S. #110, Philadelphia, PA 19102–1192.**

RESEARCH ASSOCIATE—MOLECULAR BIOLOGY. Applications are invited for a research position available immediately in a small independent privately endowed laboratory newly organized for research in the molecular biology of human diseases, with emphasis on the development of novel diagnostic tests for diseases and disease agents. Experience in biochemistry and molecular genetics or cell biology required. Familiarity with monoclonal antibody techniques and molecular cloning useful; but demonstrated scientific originality and imagination more important than area of specialized expertise. Apply by mailing résumé and a brief statement of research interests and accomplishments to: **EPG Laboratories, 111 East Shore Road, Manhasset, Long Island, NY 11030.**

RESEARCH ASSOCIATE. Research protein purification and crystallization of macromolecules, including: amino acid sequencing of proteins, isolation of proteins from sera, ascites fluids and urines, and purification of proteins by gel filtration, ion exchange chromatography, electrofocusing and chromatofocusing; assessing homogeneity of proteins by analytical electrophoresis; subjecting crystal to x-ray crystallography to determine three-dimensional structures of proteins; crystallization of proteins in space using microgravity techniques; enzymatic and chemical cleavage of antibodies and chemical modification of specific amino residues in preparation for crystallization of fragments. Requires knowledge of micro- and-macro-seeding techniques, vapor diffusion, "hanging and sitting drops," batch crystallization methods, theories of nucleation and crystal growth, automated and manual techniques of protein chemistry and preparative scale electrophoresis. Also requires six graduate courses in immunology or 2 years of experience in immunology lab. Requires Ph.D. in Biology/Biochemistry and 6 months of experience in job offered. Full-time position. Salary $24,000 per year. Apply at: **Texas Employment Commission, Amarillo, TX**, or send résumé to: **Texas Employment Commission, TEC Building, Austin, TX 78778, Job Order #6449077.** *Ad paid for by an Equal Employment Opportunity Employer.*

RESEARCH SCIENTIST

Research Scientist positions available in Microbial Pathogenesis and Molecular Immunology to study the molecular pathogenesis and basis of immunity to *Yersinia pestis*, the causative agent of plague. The program is focused on the identification and molecular characterization of microbial virulence determinants and their mechanisms of action; the nature and characterization of protective immunity to plague; and vaccine development. Interested applicants should send their curriculum vitae, reprints of representative publications, and names of three references to: **Dr. Arthur M. Friedlander, Chief, Bacteriology Division, U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Frederick, MD 21702. Telephone: 301-619-7341.**

PENNSTATE

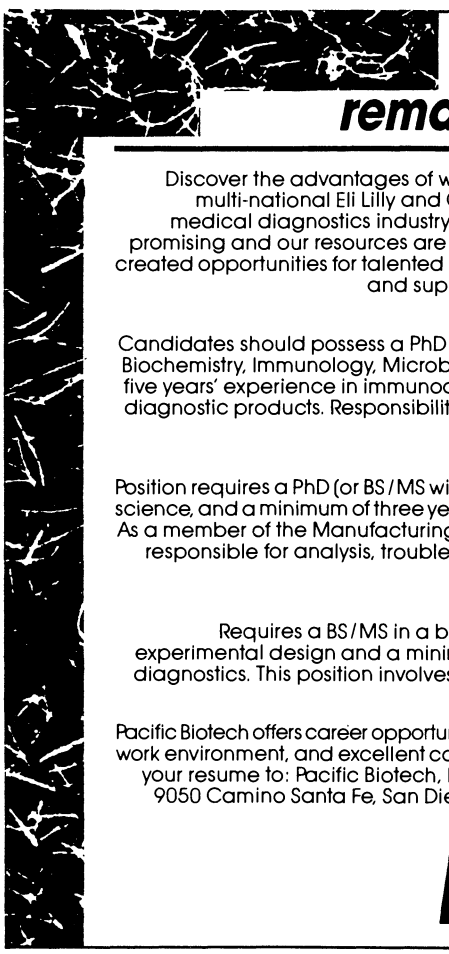
University Park Campus

HEAD, DEPARTMENT OF FOOD SCIENCE

The College of Agricultural Sciences seeks applicants for the position of Food Science Department Head. The individual chosen will be responsible for leadership, administration, and coordination of resident instruction, extension, and research programs of the department. The successful candidate will have administrative responsibility for academic affairs, departmental personnel, financial matters, and physical facilities. The individual will also be responsible for leadership and coordination of programs in relation to other departments, government agencies, food and related industries, and consumers. Required qualifications are an earned Ph.D. or equivalent academic degree in Food Science or a closely related area, and evidence of effective administrative and leadership abilities or strong evidence of potential administrative and leadership abilities. A significant period of professional and/or academic experience in Food Science is highly desirable, as is experience with or in-depth knowledge of university teaching, research, and extension functions. Evidence of effective interaction with the food industry and related industries, as well as with government agencies is also highly desirable. Salary will be commensurate with the qualifications and experience of the candidate. Interested individuals are invited to submit 1) a resume with documentation of teaching, research, extension, administrative, and leadership experience; and 2) a statement which reflects the candidate's personal philosophy of administration and leadership to: **Dr. Donald B. Thompson, Chairman, Search Committee, Room 8-C, Borland Laboratory, Penn State University, University Park, PA 16802. (814) 863-0481, (814) 863-6132 (FAX).**

Applications will be accepted until July 31, 1992, or until the position is filled.

An Affirmative Action/Equal Opportunity Employer
Women and Minorities Encouraged to Apply



Make a remarkable discovery

Discover the advantages of working for Pacific Biotech, a subsidiary of multi-national Eli Lilly and Company. As a leader in the burgeoning medical diagnostics industry in both the U.S. and abroad, our future is promising and our resources are strong. Pacific Biotech's rapid growth has created opportunities for talented individuals in the research, development and support of rapid *in vitro* diagnostic products.

SENIOR SCIENTIST, R&D

Candidates should possess a PhD (or BS/MS with equivalent experience) in Biochemistry, Immunology, Microbiology or a related discipline, and two to five years' experience in immunoassay development for infectious disease diagnostic products. Responsibilities include new product development in coordination with project teams.

SENIOR SCIENTIST, MTS

Position requires a PhD (or BS/MS with equivalent experience) in a biological science, and a minimum of three years' R&D experience in *in vitro* diagnostics. As a member of the Manufacturing Technical Support group, this position is responsible for analysis, troubleshooting, and optimization of diagnostic products.

SCIENTIST, MTS

Requires a BS/MS in a biological science, a strong knowledge of experimental design and a minimum of three years' experience in *in vitro* diagnostics. This position involves the optimization and troubleshooting of immunodiagnostic products.

Pacific Biotech offers career opportunities stemming from expansion, a dynamic work environment, and excellent compensation and benefits. Please forward your resume to: Pacific Biotech, Inc., Human Resources - Dept. SCIMG/58, 9050 Camino Santa Fe, San Diego, CA 92121. We support diversity in our workforce/EOE.

PACIFIC BIOTECH, INC.

Cambridge NeuroScience is a growing pharmaceutical company committed to the discovery and development of unique medicines for the treatment of major disorders of the nervous systems. The Company is recognized for its combination of scientific expertise in biotechnology, chemistry, and pharmacology, as well as its collaborations with leading academic institutions and experts. We are seeking to expand our efforts with the help of the following professionals:

In Vivo PHARMACOLOGY

Staff Scientist **Cerebral Ischemia** – (Job Code 56SSBI) Ph.D. in Neuroscience with at least 2 years of post-doctoral experience with *in vivo* models of focal/global cerebral ischemia and/or traumatic brain/spinal cord injury. Knowledge of histology and neuroanatomy is needed, and training in electrophysiology, behavioral science, or cardiovascular physiology/pharmacology would be desirable. The successful candidate will help lead a group responsible for identifying proprietary neuroprotective agents for treating human diseases.

Staff Scientist **Nerve Regeneration** – (Job Code 56SSGF) Ph.D. in Neuroscience with at least 2 years of post-doctoral experience with *in vivo* mammalian models of peripheral and/or central neuropathy/injury evaluating the action of neurotrophic growth factor proteins. Knowledge of histology and neuroanatomy is needed, and training in electrophysiology and behavioral science would be desirable. The successful candidate will help lead a group responsible for evaluating the therapeutic potential of proprietary growth factors in neuronal injury/degeneration.

CHEMISTRY

Staff Scientist **Medicinal Chemistry** – (Job Code 48SSMC) Ph.D. in Organic or Medicinal Chemistry. Post-doctoral and, preferably, pharmaceutical industry experience. Will be responsible for the design and synthesis of novel compounds to treat disorders of the central nervous system. Particular emphasis on the discovery of neuronal ion channel blockers to treat neurodegeneration.

Staff Scientist **Analytical Chemistry** – (Job Code 48SSAC) Ph.D. in Chemistry or related field with at least 5 years' experience in the application of analytical techniques to the discovery and development of therapeutics. Will lead a small group with responsibility for drug candidates, both small organic molecules and proteins.

In Vitro PHARMACOLOGY

Staff Scientist **Neurotrophic Factors** – (Job Code 47SSNT) Ph.D. with at least 2 years' post-doctoral experience in evaluating the actions of neurotrophic factors at the cellular and/or molecular level.

Staff Scientist **Neurophysiology** – (Job Code 53SSNP) Ph.D. with 2 or more years' post-doctoral experience in single-cell neurophysiology, membrane biophysics or related field. Expertise in one or more of the following techniques is desired: voltage/patch clamp; intercellular microelectrode recording; brain-slice recording; and measurement of intracellular calcium.

BIOTECHNOLOGY

Staff Scientist **Molecular Biology** – (Job Code 51SSMB) Ph.D. with 2 or more years' post-doctoral experience in molecular biology with emphasis in gene isolation and analysis including: library construction, gene/cDNA cloning; quantitative RNA analysis; DNA sequence analysis; and PCR using degenerate primers. Interest in cell death genetics and biochemistry valuable.

If you are interested in participating in a company that demands and supports scientific excellence which will positively impact on the treatment of neurological disorders, consider a career at Cambridge NeuroScience. Please indicate appropriate job code when you apply to: Human Resources, Dept. SCI0508, Cambridge NeuroScience, One Kendall Square, Building 700, Cambridge, MA 02139. An Equal Opportunity Employer.

CAMBRIDGE NEUROSCIENCE

Announcement and call for abstracts for

Advances in AIDS Vaccine Development:

Fifth Annual Meeting of the National Cooperative Vaccine Development Groups for AIDS

August 30 - September 3, 1992

Westfields International Conference Center

Chantilly, Virginia

SPONSORED BY:

Vaccine R&D Branch
Basic R&D Program
DAIDS, NIAID, NIH

To receive conference registration and abstract submission information, please call or write to:

ATLIS Jane Hynok, Registration Coord.
c/o ATLIS Federal Services, Inc.
6011 Executive Blvd.
Rockville, MD 20852
(301) 816-4217
FAX (301) 468-6759

Deadline for abstract submission is **July 1, 1992**

DIABETES RESEARCH CENTER

POST-DOCTORAL POSITION(S)

Available immediately (1) to both conditionally transform pancreatic β-cells and alter their MHC/HLA expression using an episomal viral delivery system or (2) to study the effects of aberrant post-translational modification on vascular endothelial cell function using recombinant methodology.

Preference is given to applicants with experience in molecular biology.

Send CV with the names of three references or inquire to:
Dr. Michael Brownlee,
Co-Director,
Diabetes Research Center,
Albert Einstein College of Medicine F-531,
1300 Morris Park Avenue,
Bronx, New York 10461

DIRECTOR BOARD ON BIOLOGY

The COMMISSION ON LIFE SCIENCES of the National Research Council (NRC) is seeking a director for ongoing studies in its Board on Biology. Requires a Ph.D. or equivalent in a life science; at least 6 years' experience in an academic or government environment (preferably both); record of holding increasingly responsible positions involving the examination of issues such as science education, research resources and research trends; demonstrated skills in communication, administration, and interpersonal relations; and broad experience and expertise in ecology, genetics, neuroscience, and biotechnology. Please send curriculum vitae and letter of interest in confidence to: NRC/CLS, NAS 343 (JB), 2101 Constitution Avenue, NW, Washington, D.C. 20418. EOE

NATIONAL RESEARCH COUNCIL

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genzyme

The **strength** *of an organization can be measured by the* **scope** *of its products. At Genzyme, we have developed a* **product pipeline** *that spans the areas of biotherapeutics, diagnostic products and services as well as pharmaceuticals and fine chemicals. This* **diversified marketing strategy** *has enabled us to* **achieve success** *on a global scale.*

Sr. Scientist Product Development

Develop ELISA-based products to detect and determine the levels of various cytokines in an array of samples. Will also supervise a technical staff and develop data for product transfer and regulatory functions. Candidates must have a Ph.D. in immunology, biochemistry, or related field and 5-10 years of post-doctoral experience including industrial product development and development of ELISA products in a variety of formats. Working knowledge of cytokines would be a plus. Excellent planning, communication, managerial, and business skills are required in order to evaluate product opportunities.

Genzyme rewards success with an excellent compensation and benefits package, including 3 weeks' vacation, a 401(k) plan with a company match, extensive insurance benefits, and an Employee Stock Purchase Plan. Please send your resume to Steve Grossman, Dept. SM58, Genzyme Corporation, One Kendall Square, Cambridge, MA 02139.

An equal opportunity employer.

Advancing Health Care Products And Services Worldwide

Protein/Carbohydrate Chemist Scientist/Sr. Scientist

The Chemistry Department of North American Vaccine, Inc., Research and Development Division, has openings for Scientists and Senior Scientists. Candidates must have a Ph.D. in Chemistry, Biochemistry or the equivalent. The individuals will be involved in the chemical modification of polysaccharides and proteins, preparation of protein-polysaccharide conjugates and the purification of these macromolecules. Several years experience in basic protein/carbohydrate chemistry is essential.

North American Vaccine, Inc. is a human pediatric vaccine research, development, and manufacturing company. Located in the Ammendale Technology Park in Beltsville, MD approximately 20 minutes from Washington, DC. We are a rapidly growing company and offer highly competitive salaries and benefits. Applicants should send curriculum vitae to:

North American Vaccine, Inc., Human Resources-R&D, 12040 Indian Creek Ct., Beltsville, MD 20705, FAX: (301) 470-6198, *AA/EOE*

CHAIRMAN

DEPARTMENT OF PATHOLOGY

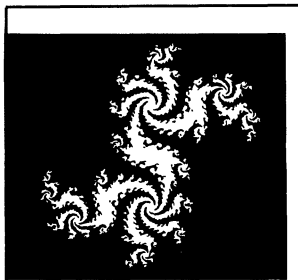
Roswell Park Cancer Institute is seeking a Chairman for the Department of Pathology. This internationally-renowned comprehensive cancer center is entering a period of renewed growth. Opportunity for research and academic activity is outstanding. Substantial academic credentials and an interest in research are highly desired. A faculty appointment will be at the School of Medicine and Biomedical Sciences, SUNY at Buffalo, according to the level of professional qualifications.

ROSWELL PARK CANCER INSTITUTE

Curriculum vitae should be sent to:

Nicholas J. Petrelli, M.D.
Chairman, Search Committee
Department of Surgical Oncology
Roswell Park Cancer Institute
Elm and Carlton Streets
Buffalo, New York 14263

Roswell Park is an EOE/MFHV



PerSeptive Biosystems is an emerging leader in the field of Biomolecule purification and analysis. Based on core proprietary technologies and existing products, the company is now rapidly expanding and has key positions in the following areas:

- Protein/Peptide Chemistry
- Polymer/Material Science
- Immunochemistry
- Organic Chemistry
- Software Development
- Chromatography
- Bioanalytical Chemistry
- Protein Purification and Characterization
- Polymer/Chemical Production, Scale-up and Manufacturing

We have openings for Ph.D., M.S. and B.S. level scientists. If you have a background in the above areas please send your resume to **Human Resources, PerSeptive Biosystems, 38 Sidney Street, Cambridge, MA 02139.**

PerSeptive Biosystems

BIOORGANIC CHEMIST or BIOCHEMIST

Ph.D. and M.S. Positions

Naturally-occurring and synthetic isothiocyanates, as well as related compounds, can prevent cancer induction by a variety of carcinogens. We are studying the mechanisms of these phenomena in laboratory animals and humans. Investigations of the effects of isothiocyanates on carcinogen metabolism and adduct formation will be carried out.

We offer a competitive salary, an excellent benefits package, plus the chance to make a significant contribution to medical research. For confidential consideration, send your *curriculum vitae* to: **Dr. Stephen S. Hecht, Director of Research, American Health Foundation, One Dana Road, Valhalla, New York 10595.** We are an equal opportunity employer m/f/h/v.

American Health Foundation

Physiologist/ Vertebrate Biologist

Assumption College invites applications for a tenure-track position at the Assistant Professor level, starting January or August 1993. A Ph.D. and a commitment to teaching are essential. Teaching duties include upper-level courses in physiology and vertebrate biology, and introductory-level courses for majors and/or non-majors. We expect the candidate to help expand the department's undergraduate research program.

Send applications, including statements of teaching and research interests, curriculum vitae, graduate and undergraduate transcripts and three letters of recommendation to Dr. Allan Barnitt, Department of Natural Sciences, Assumption College, Worcester, MA 01609 by August 20, 1992. Assumption is a Catholic liberal arts college dedicated to excellence in undergraduate education.

An Affirmative Action/Equal Opportunity Employer

ASSUMPTION COLLEGE

POSITIONS OPEN

ars Agricultural Research Service — United States Department of Agriculture

RESEARCH PLANT PATHOLOGIST CEREAL CROPS IMPROVEMENT UNIT BOZEMAN, MONTANA

The USDA Agricultural Research Services (ARS) is seeking a research plant pathologist to conduct investigations of cereal smut diseases, ranging from traditional plant pathology to contemporary genetic and/or biochemical analyses of smut fungi and their cereal hosts. The scientist will be a member of the ARS Cereals Crops Improvement Laboratory, and a member of the Plant Pathology Faculty, both located at Montana State University (MSU). A fully equipped laboratory and substantial support funds will be provided by ARS and MSU. A Ph.D. (preferably in plant pathology or a related field) and postdoctoral experience are desirable. The starting salary range is $38,861 to $60,070 and will be commensurate with research experience. For further information contact: **Dr. Victor Raboy, USDA-ARS, #619 Leon Johnson Hall, Montana State University, Bozeman, MT 59717, telephone: 406-994-5054.** For information/application procedures contact: **Julia A. Murchison, USDA-ARS-PD, 6305 Ivy Lane, Room #318, Greenbelt, MD 20770–1435, telephone: 301-334-3138.** Closing date is 1 June 1992. *U.S. citizenship required. An Equal Opportunity Employer. Women and minorities are encouraged to apply.*

STUDY DIRECTORS

Join our team of professionals to support our growing businesses. Microbiological Associates is the world leader in biopharmaceutical safety evaluation. Opportunities are available for microbiologists and virologists with 3 to 5 years of postdoctoral experience. Familiarity with Mycoplasma and/or GLP/cGMP environment an asset. These STUDY DIRECTOR positions will be responsible for supervising laboratory staff, communication with clients, and the development of research programs. Our state-of-the-art facility is located in the Washington, D.C., suburbs. We offer a comprehensive salary and benefits package that includes relocation. Send curriculum vitae to: **Microbiological Associates, Inc., 9900 Blackwell Road, Rockville, MD 20850. FAX: 301-738-1036.** *Equal Opportunity Employer, M/F/H/V.*

ATTENTION SCIENCE ADVERTISERS

$40 SPECIAL

Place your classified ad in any May–August 1992 issue of SCIENCE and get double exposure. We'll display the same position announcement at the **Employment Exchange** during the **AAAS Pacific Division Meeting** or **Science Innovation '92** for only $40 more. That's less than the cost of one additional line.

When you place your classified ad in *SCIENCE*, simply let us know that you want to take advantage of the $40 Special and we'll do the rest. Please specify the meeting of your choice or both meetings.

The Employment Exchange will take place at the **AAAS Pacific Division Meeting**, 21–24 June 1992, at the University of California, Santa Barbara campus; followed by **Science Innovation '92**, 21–24 July 1992, at the Moscone Convention Center in San Francisco, California. Thousands of scientists in various disciplines have been invited to participate. Act fast and you can reach this unique pool of candidates.

For more information on how you can interview candidates on-site please refer to the 8 May 1992 issue of **Science**, or contact **Jacquelyn Roberts at (202) 326-6737, FAX: (202) 842-1065.**

POSITIONS OPEN

BIOCHEMISTRY/MOLECULAR BIOLOGY IMMUNOLOGY/BIOPROCESSING

Exclusive positions available for B.S./M.S./Ph.D. level candidates in the Biotech, Pharmaceutical and Diagnostic Industries. For confidential consideration fax or mail curriculum vitae to:

SCIENTIFIC RESOURCES
1244 Boylston Street
Chestnut Hill, MA 02167
Telephone: 617-232-8789; FAX: 617-734-5979.
Executive Recruitment Consultants

RESEARCH: Performs biochemical laboratory research utilizing protein isolation, reconstitution of proteins into liposomes, electrophoresis techniques. Southern, Northern and Western blotting and molecular biology techniques. Isolates reticulocyte endosomes that have transferrin bound to the transferrin receptor. Solubilizes endosomes with a variety of detergents, subjects proteins to HPLC chromatography and electrophoresis under a variety of conditions to isolate the endosomes proton pump with reconstitution of the pump into liposomes. Determines amino acid sequences from purified proteins, synthesizes the corresponding oligonucleotides and screens a cDNA library constructed from erythroid precursors. Clones proton pump cDNA from erythroid cells.

Requirements: M.S. or equivalent in biochemistry. Applicants must submit documented proof of 2 years of biochemical research utilizing protein separation and reconstitution techniques into liposomes. Salary: $24,000 per year. 40 hours per week. Hours 8:00 a.m. to 4:00 p.m. Contact: **Louisiana Office of Employment Security, Job Order 835680, 2900 Dowdell Street, Shreveport, LA 71103.**

ECOLOGISTS

ASSISTANT OR ASSOCIATE SCIENTISTS

The Joseph W. Jones Ecological Research Center at Ichauway invites applications for three positions as assistant or associate scientists in ecology and natural resources science:

(1) **AQUATIC ECOLOGY**. To conduct biological or biogeochemical studies of disturbed and undisturbed wetlands and riverine ecosystems to potentially include faunal communities, biogeochemical processes and water quality, carbon dynamics, or coarse woody debris.

(2) **LANDSCAPE ECOLOGY**. Landscape level studies of disturbed and undisturbed ecosystems to potentially include aspects of biological diversity, patch dynamics, ecosystem processes or other approaches with GIS and remote sensing.

(3) **SILVICULTURE/FOREST ECOLOGY**. To conduct biological, ecological, and management research on longleaf pine ecosystems and on ecological restoration.

The scientists will develop specialty research programs (internal 67%, extramural 33%) as well as cooperative, multidisciplinary long-term research. Responsibilities include research (80%) and education (20%), and adjunct university appointments will be encouraged and facilitated. Qualifications include a Ph.D. in ecology, biology, natural resources or a related field. Also requires postdoctoral experience, strong communication skills, experience with acquiring grants, and new research directions that combine basic and applied research perspective.

The Joseph W. Jones Ecological Research Center is a new independent institution funded by the Robert W. Woodruff Foundation. The Center is located at Ichauway, a 28,000-acre experimental reserve in southwest Georgia, near Albany, with 16,000 acres of longleaf pine forests, 900 acres of limesink wetlands, and 26 miles of rivers.

The objective of the center is to develop a program of excellence in ecology and natural resource science that includes research, education and conservation goals. The center will build toward a target size of 10 to 12 scientists, their students and postdocs, administrative site management and support personnel.

Compensation is commensurate with experience, including a solid benefits and retirement program. Letters of application, résumés, and names of three references should be mailed by 25 May 1992 to: **Dr. Lindsay Ross Boring, Director, Joseph W. Jones Ecological Research Center, Ichauway, Route 2, Box 2324, Newton, GA 31770 (FAX: 912-734-4707).**

Executive Vice President and Provost

Michigan Technological University
Houghton, Michigan

The Search Committee of Michigan Technological University invites nominations and applications for the position of Executive Vice President and Provost.

Michigan Technological University, one of Michigan's four nationally recognized research universities, has an established reputation in engineering and science education. Located in the Upper Peninsula, Michigan Technological University is a public institution consisting of approximately 350 teaching faculty, 1,000 staff, and more than 6,000 students enrolled in undergraduate and graduate courses of study.

The Executive Vice President and Provost will serve as the chief operating officer responsible for all academic, research, and student services, and University operations. In the absence of the President, the Executive Vice President and Provost will act as chief executive officer.

The Search Committee will seek evidence of the following:

- leadership ability in academic and administrative affairs
- ability to communicate and interact with the faculty, staff, students, and administrators
- scholarly achievement
- understanding the mission of a technological university
- ability to foster broad participation in the continuous improvement of programs
- budgeting and management ability

Candidates should have an earned doctorate, experience in academic and business administration, and a commitment to affirmative action and diversity.

Applications, nominations, or inquiries should be directed to:

Search Committee
Executive Vice President and Provost
Personnel Services: Laura Alexander
Michigan Technological University
1400 Townsend Drive
Houghton, MI 49931-1295

The Search Committee will begin reviewing applications immediately and will accept applications until the position is filled. Applications from women and minorities are encouraged.

Michigan Technological University is an equal employment opportunity, affirmative action employer/educational institution.

The Institute of Molecular Biology, Inc. (IMB) is a rapidly growing biotechnology company committed to bringing quality pharmaceuticals to the health care field. IMB offers the opportunity to work among a group of dedicated, highly respected scientists in a newly constructed facility in the Massachusetts Biotechnology Research Park located approximately 40 miles outside Boston, MA. IMB is seeking to fill new positions in the following areas:

Applied Research Scientist

This position involves designing and conducting in vivo efficacy studies in tissue repair and coordinating the conduct of the supporting analytical and in vitro evaluations. The ideal candidate would have expertise in: 1.The physiology of the repair of one or more tissue types such as bone, nerve, and skin, etc.; 2. Polypeptide growth or differentiation factors; and 3.The statistical analysis of data and writing of scientific reports. A working knowledge of common protein chemistry and molecular biology techniques is helpful. Requires an MD, PhD, DVM or equivalent.

Protein Chemist

This position involves the purification and characterization of novel proteins involved in the regulation of cell growth and coordinating the conduct of the supporting in vitro evaluations. The ideal candidate would have expertise in: 1.HPLC/FPLC; 2.Gel electrophoresis and Western analysis; 3.Peptide mapping; 4.Immunohistochemistry; and 5.The writing of scientific reports. Working knowledge in Northern blot analysis and in situ hybridization helpful. Requires PhD with 2+ years of postdoctoral or other equivalent experience.

IMB is an equal opportunity employer and offers competitive salary and benefits. For consideration please send your resume to: ***Human Resources, Institute of Molecular Biology, Inc., One Innovation Drive, Worcester, MA 01605-4308.***

RECEPTOR PHARMACOLOGIST/ BIOCHEMIST

DowElanco, a research-based agricultural products company, is seeking a biochemist to join the entomologists, biochemists and chemists of the Insect Management Discovery Group to participate in the discovery of novel insect control agents and technologies.

Responsibilities: To conduct a research program investigating novel insect control agents and to develop new approaches for the control of insect pests. To participate in multidisciplinary teams focused on advancing potentially useful insect control agents and technologies through the discovery process.

Requirements: Ph.D. in Entomology, Biochemistry or Zoology, and a strong background in insect receptor biochemistry and pharmacology; experience in molecular biology highly desirable. Post-doctoral research experience preferred. Excellent communication, computer and interpersonal skills are a must.

DowElanco offers an excellent salary and benefits package and outstanding opportunities for advancement in an exciting interactive research environment in a new state-of-the-art research facility. Send your resume and names of three references by July 1, 1992 (or until filled) to: Ray Brinkmeyer, R&D Recruitment Manager, DowElanco, 9002 Purdue Road, Indianapolis, IN 46268-1189. Equal Opportunity Employer.

DowElanco™

Research Pharmacologist

Position available for a scientist with Ph.D. in pharmacology or related discipline with 1-3 years of postdoctoral experience. Individual would join a team of researchers currently conducting in vivo and in vitro studies in combination chemotherapy, drug evaluation, and experimental model development as related to cancer and other diseases. The individual would interact with other scientists and sponsors and would be encouraged to pursue grant support.

With a staff of over 700, Southern Research Institute is an independent research organization engaged in state-of-the-art, interdisciplinary studies. Research areas include cancer and viral disease cause and prevention, preclinical drug development and evaluation, environmental sciences, and aerospace materials research.

To apply, send c.v. to Mr. Tracy E. Higgins, Dept. 600, Human Resources, Southern Research Institute, P.O. Box 55305, Birmingham, AL 35255-5305.

We are an equal opportunity/affirmative action employer.

POSITIONS OPEN

RESEARCH POSITION: Seeking individual with Ph.D. or postdoctoral research experience in cell physiology or molecular biology to join our group as an **ASSISTANT RESEARCH PHYSIOLOGIST**. Research focuses on transmembrane ionic signaling and the expression, characterization and cloning of liver plasma membrane transport proteins. *Equal Opportunity Affirmative Action Employer.* Send curriculum vitae and names of three references to: **Dr. Bruce F. Scharschmidt, GI Division, HSW-1120, University of California, San Francisco, CA 94143–0538.**

MOLECULAR NEUROBIOLOGIST OR CELL BIOLOGIST

The Department of Anatomy and Cell Biology at Emory University invites applications for a tenure-track position at the Assistant Professor level. Candidates must have a Ph.D. or M.D. degree, significant postdoctoral experience, a competitive research program and publication record, and be able to participate in team-taught courses in cell biology. Individuals with demonstrated excellence in contemporary cell or neurobiology research involving application of molecular approaches are especially encouraged to apply. Interviews will begin in early fall. Candidates should submit a letter of application, curriculum vitae, reprints, a description of research interests, and names and addresses of four individuals to be contacted for references to: **Dr. Bryan Noe, Search Committee Chair, Department of Anatomy and Cell Biology, Emory University School of Medicine, Atlanta, GA 30322–3030.** *Emory University is an Equal Opportunity/Affirmative Action Employer.*

RESEARCH SPECIALIST

Perform research in the area of developmental neurobiology, neuropeptide gene expression, neonatal epileptic seizure. Study the rules of glucocorticoid receptors in neuropeptide gene expression and neonatal epileptic seizure models by using in situ hybridization histochemistry and EEG recording from receptor antagonist-implanted animals. Analyze results and prepare reports. Publish in academic journals. Requires: Ph.D. in neuropharmacology. Specialized knowledge of the anatomy of rat brain including hypothalamic nuclei and neuropathology of neonatal diseases including neonatal epilepsy. Background in genetic expression, Northern blotting and immunohistochemistry. Familiarity with techniques that include receptor binding, radio immunoassay and data analysis. Salary: $575 per week. Job/interview site: **Los Angeles, California**. Send this ad and résumé to: **Job #DN8429, P.O. Box 9560, Sacramento, CA 95823–0560** no later than 23 May 1992.

Agricultural Research Service — United States Department of Agriculture

SOIL CHEMIST

The United States Department of Agriculture (USDA), Agricultural Research Service (ARS), Poultry Production and Product Safety Research Laboratory, Fayetteville, Arkansas, is seeking a soil chemist. The incumbent will work with a team of scientists to establish the effect of land application of poultry waste on the quality of surface and ground water. The incumbent will be involved in the development of methods of analysis for soil water, with particular emphasis on phosphorus, and assisting in model development that relates soil test phosphorus to runoff water quality. A Ph.D. degree is desirable and the *incumbent must be a United States citizen.* Salary is commensurate with experience ($32,423 to $60,070 per annum). For information on the research program and position, contact: **William Huff, telephone: 501-575-2104**. For information on application procedures/forms, contact: **Jeanette Hubbard, telephone: 301-344-1222**. Applications in response to this advertisement should be marked **ARS-D2S-074 (S-02-026)**. Applications must be postmarked by 26 May 1992. Mailing address:

USDA, ARS, Personnel Operations Branch, Southern Section
Room 341-A, 6305 Ivy Lane
Greenbelt, MD 20770

The USDA is an Equal Opportunity Employer.

POSITIONS OPEN

MOLECULAR BIOLOGIST/CHEMIST

M.S./Ph.D. in molecular biology/chemistry with extensive experience in chemical synthesis of RNA/DNA needed to assist in synthesis of RNA/DNA peptides in growing, profitable biotech company. Experience using/servicing automated synthesizers essential. Ability to work well with others, cheerful attitude, and willingness to help do whatever needed vital. Hours: 4:30 a.m. to 1:30 p.m., Monday to Friday plus one Saturday per month. Salary: $40,000's. Excellent benefits. Must be willing to relocate to Oregon. Please send résumé and references to: **Personnel, 29970 Southwest Town Center Loop West, Suite B-419, Wilsonville, OR 97070.**

Agricultural Research Service — United States Department of Agriculture

RESEARCH PHYSIOLOGIST (POULTRY) POULTRY RESEARCH LABORATORY GEORGETOWN, DELAWARE

ARS is seeking a permanent full-time research physiologist (poultry), to serve as a member of a research team investigating the cellular mechanisms regulating body composition of broilers. The research area of the incumbent is the characterization of biochemical mechanisms involved in the regulation of skeletal muscle fiber growth and development. *Candidates must be U.S. citizen* and have a knowledge of muscle growth and development and skill in protein biochemistry or molecular biology and muscle cell culture techniques. Knowledge of avian biology is desirable. Salary commensurate with experience: $32,000 to $55,000. For information on the research program and position, contact: **Dr. Tom Oscar at 302-856-0046**. For information on application procedures, contact: **Angela Canterini at 301-344-8560**. Applications in response to this advertisement must be marked **2N042** and received by 6 July 1992.

USDA/ARS is an Equal Opportunity Employer.

MEETINGS

MOLECULAR AGRICULTURE FOR THE PACIFIC RIM
First Pacific Rim Food & Agricultural Biotechnology Conference

UNIVERSITY OF CALIFORNIA, DAVIS
20 to 24 JUNE 1992

Poster abstracts deadline: 25 May 1992.
For information and abstract forms contact: **Martina McGloughlin, Biotechnology Program, University of California, Davis, Davis, CA 95616–8766. Telephone: 916-752-5326. FAX: 916-752-3085.**

COMPUTER MARKETPLACE

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WIN $10,000

PUZZLE #2

There's more cash in your 1992 Pierce Catalog… another $10,000! Solve this crossword puzzle correctly and it could be yours.

NOTE: All hyphens have been eliminated.

(Hint: The NEW PRODUCTS section of your 1992 Pierce ImmunoTechnology Catalog and Handbook holds all the answers!)

ACROSS

5. Best known as polar neuronal tracer
8. Fifty new ones to choose from
12. Accepted as standard for protein quantitation
14. Thevenin used this to conjugate soybean trypsin inhibitor and trypsin to yield a fluorescent species
15. 95kD antigen (or a lily)
16. Powerful blocking agent for immunoblots
17. Used to label tubulin and aldolase at pH 6.8-7.5
19. Contained in light collecting apparatus of algae
22. Enzyme purified by N^{α}-CBZ Phenylalanine
23. React with amines to form extremely stable sulfonamides
25. Will inhibit ^{125}I-EGF binding to EGF receptor
26. Classified into erythrocyte (68kD) and muscle types (107kD)
27. Used to form conjugates that contain hindered disulfide bonds and exhibit enhanced stability *in vivo*

DOWN

1. Faster than "shaker" method
2. Functions as "reverse" affinity matrix
3. Lacks proline rich sequence found in hinge region of IgG and IgA
4. Fast blocker
6. Carbonyl-reactive crosslinker that is iodinatable and photoreactive
7. Kit used to identify purity of cell line
9. Previously, no product available for one-step purification of this
10. Described by Young as novel substrate for HRP
11. Plays important role in cell adhesion and extensions
13. Easy way to radiolabel your cell surface proteins
18. Synthesis of collagen can be quantitated by measuring release of this peptide
20. Allows production of free sulfhydryls on macromolecules for conjugation
21. Can be used for histology with acetone-fixed snap frozen tonsil
24. Substrate for alkaline phosphatase in immunoblotting applications

GOOD LUCK!

How you can win $10,000 (U.S. dollars)

1. Solve the puzzle. All of the answers can be found on pages 1-56 in the New Products Section of your 1992 Pierce ImmunoTechnology Catalog and Handbook. Only one entry per person. Photocopies of this puzzle will be accepted.
2. Complete the information at right. All information must be included.
3. Place completed puzzle in an envelope and mail to: Pierce Puzzle, P.O. Box 117, Rockford, IL 61105. All envelopes must be postmarked no later than August 1, 1992.
4. If more than one entrant correctly solves the puzzle, the winner will be selected in a random drawing on August 15, 1992. Winner will be notified no later than September 1, 1992.
5. All entrants must be researchers at least 21 years of age and employed by an industrial, academic, clinical or governmental research facility. Employees of Pierce Chemical, Pierce Europe, Perstorp, Pierce Agents/Distributors or family members of aforementioned are ineligible.
6. All federal, state and local laws and regulations apply; void where prohibited by law.
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8. Taxes are the sole responsibility of the winner.
9. No purchase necessary to win.

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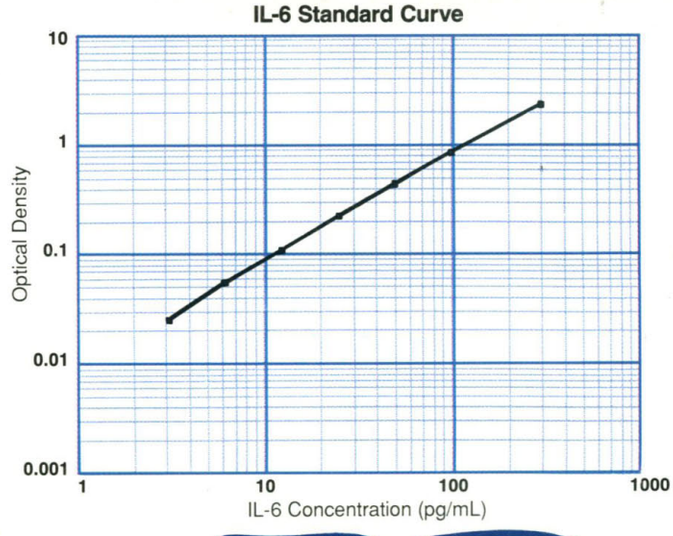

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